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14. ABSTRACT

SupportNet aims to assess the level of secondary trauma and job burnout among military behavioral health providers and to provide a pilot support system for providers working at with military trauma survivors. In the fourth year of the project, we completed the RCT and data analysis of behavioral health.

Job burnout and secondary trauma are serious issues for military behavioral health providers who are continually exposed to extensive traumatic material on an on-going basis. Job burnout and STS potentially increase turnover among mental health providers, decrease positive clinical outcomes with clients, and have negative consequences for mission readiness for soldiers.

15. SUBJECT TERMS
Secondary traumatic stress, compassion fatigue, job stress, burnout, behavioral health providers, combat trauma.

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BODY

The following are the three objectives for the SupportNet project. These are provided here to reference the objective(s) supported by the accomplishment for each of the Research and Project Management Accomplishments listed.

Objective 1: We will conduct an initial needs assessment to determine the level of secondary trauma and burnout in military mental health providers from U.S. Army Posts around the country in order to establish prevalence rates for secondary trauma, burnout, and compassion fatigue in military mental health providers.

Objective 2: We will evaluate the utility of social cognitive theory as a framework for understanding the stress process for military mental health providers by using a quantitative evaluation of coping self-efficacy to predict negative outcomes for military mental health providers.

Objective 3: We will develop and evaluate a theoretically based support system called SupportNet to empower behavioral health providers in developing critical self-assessment skills, self-regulatory abilities, and support seeking capacities and will test the system's effectiveness by completing a randomized controlled trial and a program and process evaluation.

Research accomplishments:

a) We completed a randomized controlled trial (RCT) to test the effectiveness of SupportNet, in October, 2014 (Objective 3).

Journal articles published/accepted for publication (Objectives 2 & 3):

b) A journal article was published (Appendix 1). Using a theoretically-driven model based on social cognitive theory, this two-study investigation examined the indirect effects of secondary traumatic stress (STS) on secondary traumatic growth via perceived social support and secondary trauma self-efficacy in a longitudinal design. Our findings indicated the strong support for the cultivation hypothesis and the lack of support for the enabling hypothesis. Implication of these findings is that psychological interventions may benefit more by enhancing self-efficacy with the intent to facilitate perceived social support.
    1. Shoji, K., Bock, J., Cieslak, R., Zukowska, K., Luszczynska, A., & Benight, C. C. (2014). Cultivating secondary traumatic growth among healthcare workers: The role of social support and self-efficacy. Journal of Clinical Psychology. 70, 831-846. doi:10.1002/jclp.22070

c) A manuscript was accepted (Appendix 2): This study aimed at systematically reviewing and meta-analyzing the strength of associations between self-efficacy and job burnout (the global index and its components). We investigated whether these associations would be moderated by: (a) the type of measurement of burnout and self-efficacy (b) the type of occupation (c) the number of years of work experience and age, and (d) culture. Significant self-efficacy--burnout relationships were observed across countries, although the strength of associations varied across burnout components, participants' profession, and their age.
    1. Shoji, K., Cieslak, R., Smoktunowicz, E., Rogala, A., Luszczynska, A. & Benight, C. C. (2015). Associations between job burnout and self-efficacy: A meta-analysis. Anxiety, Stress, and Coping. Accepted for publication.

Conference presentations completed (in chronological order; Objectives 2 & 3):

d) Poster presented at APA (Appendix 3): There has been a rise in the amount of internet-mediated/ eHealth interventions. High rates of attrition and low adherence have been present within eHealth intervention research. There is a limited base of literature highlighting individual characteristics related to attrition and adherence. The current study sought to standardize the eHealth readiness scale, implemented to examine individual characteristics assessing participant readiness, and adherence. Results showed the eHealth readiness scale items demonstrate good internal consistency and a stable one-factor solution and indicated the eHealth readiness scale is a sufficient criterion valid measure of self-efficacy and ease with technology usage.
    1. Bhalla, A., Al-Tabaa, N., McDonald, J.M., Hanneman, S., & Durham, R.L. (2014, August). Psychometric examination of a readiness scale for an RCT of an online intervention. Presented at the 122nd American Psychological Association Annual Convention, Washington D.C.

e) Poster presented at ISRII (Appendix 4): The study investigated the relationship between web intervention engagement and the reduction of job burnout in a randomized controlled trial. We examined both subjective and objective measures of engagement and how they affect the reduction of job burnout. Objective engagement measures were generated based on participants' user history. Results showed small to medium negative correlations between engagement and job burnout. The number of unique pages visited was significantly correlated with subjective engagement measures. Patterns that emerged for correlations among job burnout and subjective engagement measures were discussed.
    1. Shoji, K., Yeager, C., Gibson, F.W., Cieslak, R., Bock, J., Decker, L., Anderson, V., & Benight, C. C. (2014, October). SupportNet for military behavioral healthcare providers: Website engagement and job burnout. Poster session presented at the annual conference of the International Society for Research on Internet Intervention. Valencia, Spain.

f) Poster presented at Med 2.0 (Appendix 5): The study examined the effectiveness of the SupportNet intervention, designed to reduce job burnout among behavioral healthcare providers for U.S. military personnel in a randomized controlled trial (RCT). Results showed a significant reduction in job burnout among participants who used SupportNet with a coaching component. The results of present study showed participants who used the SupportNet with coaching guidance reduced job burnout after the 8-week intervention more than the other group. Job burnout among those who participated without coach's guidance was not different between pre- and post-RCT. These results indicated that the coaching component with online support was effective in this population. Behavioral healthcare providers may prefer face-to-face interaction rather than working solely online.
    1. Shoji, K., Gibson, F. W., Cieslak, R., Anderson, V., Bock, J., Decker, L., Yeager, C., & Benight, C. C. (2014, November). SupportNet: Preliminary results of a randomized controlled trial. Poster session presented at the annual conference of the Medicine 2.0. Maui, HI.

g) Poster presented at ISTSS (Appendix 6): The study sought to assess the psychometric properties of the eHealth readiness scale in an RCT of the SupportNet intervention, which aimed to reduce burnout and secondary-traumatic stress in military mental health

providers. Results demonstrate scale items to have a good internal consistency and a stable one-factor solution. Contrary to the hypothesis, results did not illustrate any significant relation between eHealth readiness and time spent on the SupportNet website. Thus predictive validity was unable to be established for the scale.

1. Bhalla, A. Durham, R.L., Yaeger, C., Luther, E., Gibson, F., & Benight, C.C., (2014, November). *The psychometric validation of a readiness scale for participants in an online intervention for burnout and secondary traumatic stress.* Poster presented at the 2014 International Society for Traumatic Stress Studies annual conference, Miami, FL.

h) Poster presented at ISTSS (Appendix 7): This study examined the role of a sexual assault history on the development of secondary traumatic stress and job burnout. Although all mental health providers are at risk for experiencing the effects of secondary traumatic stress and job burnout, those with a sexual assault history may be even more sensitive to this stress and more likely to develop job burnout. Job burnout self-efficacy may serve as a mediating mechanism between secondary traumatic stress and job burnout because a belief in your ability to manage stressors often changes how challenges and goals are approached and dealt with. The results suggest that job burnout self-efficacy serves as a self-regulatory role by which secondary traumatic stress relates to job burnout in providers without a sexual assault history. For those with a sexual assault history, the distress caused by the trauma may override the buffering effect that job burnout self-efficacy has on the relationship between secondary traumatic stress and job burnout.

1. Boesdorfer, G., Nichols, C., Shoji, K., Benight, C. C., Gibson, F. (2014, November). Effects of sexual assault history on the relationship between secondary traumatic stress, job burnout self-efficacy, and burnout for military mental health providers. Poster session presented at the annual conference of the International Society for Traumatic Stress Studies. Miami, FL.

i) Paper presented at ESTSS (Appendix 8): A meta-analytic paper on the relationship between job burnout and self-efficacy showed that a systematic literature search found 53 original studies meeting inclusion and evaluation criteria. Preliminary results show there is a moderate association between job burnout and self-efficacy. The results suggested that, due to high correlations between job burnout and secondary traumatic stress, there is a substantial likelihood that a professional exposed to secondary trauma would report similar levels of job burnout and secondary traumatic stress, particularly if job burnout and secondary traumatic stress were measured within the framework of compassion fatigue.

1. Cieslak, R., Shoji, K., Lesnierowska, M., Smoktunowicz, E., Benight, C. C. (2015, June). Which comes first: Job burnout or secondary traumatic stress? Paper presented at the annual conference of the European Society for Traumatic Stress Studies. Vilnius, Lithuania.

j) The next research publication currently underway is the manuscript reporting our findings of the RCT. The data analysis has been completed and an additional meta-analysis was performed to provide a helpful context to our RCT findings (Objective 3).

k) Another research publication underway is regarding the prevalence of job burnout in military behavioral health providers. Currently, there are no studies published on burnout for this population and our findings will provide valuable data for interested stakeholders (Objective 3).

l) We have begun a book based on the research findings and lessons learned from the SupportNet initiative designed for key stakeholders (e.g., directors of behavioral health, military mental health providers, occupational health providers, hospital commanders, etc.). Tentatively titled, " Beyond the Battlefield: Burnout and Secondary Trauma in Military Behavioral Health Providers ", the work will cover what we have learned in the process of completing this project, including the important implications of our prevalence findings, challenges associated with our web intervention, conducting our Clinical Trial, and our RCT outcomes. There are currently two publishers interested in our book: Oxford Press and Palgrave-Macmillan. We expect to finalize the publisher in September 2015 (Objective 3).

Project management accomplishments:

a) Two new personnel were hired: a post-doc for research analysis, Shaun Stearns, and a dissemination specialist, Katie Kopp.
b) The effort of two other clinical personnel and one software development personnel was decreased because the RCT was successfully completed.
c) Two of the three published articles were made open access to all readers to increase dissemination of our findings.
d) Attended five conferences to present SupportNet findings (Objective 3): APA (August 2014), Medicine 2.0 (November 2014), ISRII (October 2014), ISTSS (November 2014), and ESTSS (June 2015).
e) A six-month no cost extension was files and approved to allow for full completion of Objective 3, specifically regarding dissemination. The progress on this project was delayed due to the unexpected departure of two key members of our team. In September 2014, our research director left the university and our research dissemination specialist departed this March before completion of her assigned tasks.
f) A meeting has been scheduled in July 2015 with Fort Carson partners to present findings and recommendations. Potential continuing collaboration will be explored to leverage our findings for the benefit of their military behavioral health providers.

Recommended Changes and Future Work:

One area of future work that the SupportNet Research Team is now exploring is to identify other populations who could benefit from our intervention and findings. Given the absence of empirical studies on secondary traumatic stress and job burnout in other military providers, such as nurses, doctors, etc., research in this area would be a valuable in increasing our understanding of these important topics.

We are also exploring other local community organizations that could also benefit from interventions for secondary traumatic stress and job burnout. These include domestic violence organizations, community behavioral health providers, community medical providers, and first responders.

KEY RESEARCH ACCOMPLISHMENTS

a) We completed the randomized controlled trial, and began the process of collecting data. Appendix 9 displays the updated CONSORT Chart for SupportNet, which summarizes the flow of the RCT.

b) We published 2 primary publications and provided 7 conference presentations at five different international professional meetings. The foci and attendees of these five conference represent the targeted applied and research audiences.

REPORTABLE OUTCOMES

Published/Accepted Papers and Conference Presntations.

Bhalla, A., Al-Tabaa, N., McDonald, J.M., Hanneman, S., & Durham, R.L. (2014, August). Psychometric examination of a readiness scale for an RCT of an online intervention. Presented at the 122nd American Psychological Association Annual Convention, Washington D.C.

Bhalla, A. Durham, R.L., Benight, C.C., Bock, J., & Yaeger, C. (2014, November). Examination of burnout, secondary traumatic stress, and coaching on a measure of readiness for online interventions. Poster presented at the 2014 International Society for Traumatic Stress Studies annual conference, Miami, FL.

Bhalla, A. Durham, R.L., Yaeger, C., Luther, E., Gibson, F., & Benight, C.C., (2014, November). *The psychometric validation of a readiness scale for participants in an online intervention for burnout and secondary traumatic stress.* Poster presented at the 2014 International Society for Traumatic Stress Studies annual conference, Miami, FL.

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Shoji, K., Cieslak, R., Smoktunowicz, E., Rogala, A., Luszczynska, A. & Benight, C. C. (2015). Associations between job burnout and self-efficacy: A meta-analysis. Anxiety, Stress, and Coping. Accepted for publication.

Shoji, K., Gibson, F. W., Cieslak, R., Anderson, V., Bock, J., Decker, L., Yeager, C., & Benight, C. C. (2014, November). SupportNet: Preliminary results of a randomized controlled trial. Poster session presented at the annual conference of the Medicine 2.0. Maui, HI.

Shoji, K., Yeager, C., Gibson, F.W., Cieslak, R., Bock, J., Decker, L., Anderson, V., & Benight, C. C. (2014, October). SupportNet for military behavioral healthcare providers: Website engagement and job burnout. Poster session presented at the annual conference of the International Society for Research on Internet Intervention. Valencia, Spain.

CONCLUSION

The fourth year of SupportNet was productive. We made progress toward completing Objectives 2 and 3 of this research (Objective 1 having already been met).

We published 2 primary publications and provided 7 conference presentations at five different international professional meetings.

We submitted a request for a no cost extension for an additional six months to successfully complete our dissemination plan.

We are progressing on about 2 other papers and a book this year and are investigating future grant opportunities.

APPENDICES:

Appendix 1: Cultivating secondary traumatic growth among healthcare workers: The role of social support and self-efficacy

Cultivating Secondary Traumatic Growth Among Healthcare Workers: The Role of Social Support and Self-Efficacy

Kotaro Shoji,[1] Judith Bock,[1] Roman Cieslak,[1,2] Katarzyna Zukowska,[2] Aleksandra Luszczynska,[1,2] and Charles C. Benight[1]

[1] *University of Colorado at Colorado Springs*
[2] *University of Social Sciences and Humanities*

Objective: This 2-study longitudinal investigation examined the indirect effects of secondary traumatic stress (STS) on secondary traumatic growth via two mediators: perceived social support and secondary trauma self-efficacy. In particular, we tested if the 2 hypothetical mediators operate sequentially, that is, with secondary trauma self-efficacy facilitating social support (i.e., cultivation hypothesis) and/or social support enhancing self-efficacy (i.e., enabling hypothesis). **Method:** Participants in Study 1 ($N = 293$ at Time 1, $N = 115$ at Time 2) were behavioral healthcare providers working with U.S. military personnel suffering from trauma. Study 2 was conducted among Polish healthcare workers ($N = 298$ at Time 1, $N = 189$ at Time 2) providing services for civilian survivors of traumatic events. **Results:** In both studies, multiple mediational analyses showed evidence for the cultivation hypothesis. The relationship between STS at Time 1 and secondary traumatic growth at Time 2 was mediated sequentially by secondary trauma self-efficacy at Time 1 and social support at Time 2. The enabling hypothesis was not supported. **Conclusion:** Education and development programs for healthcare workers may benefit from boosting self-efficacy with the intent to facilitate perceived social support.
 J. Clin. Psychol. 70:831–846, 2014.

Keywords: secondary traumatic stress; secondary traumatic growth; social cognitive theory; perceived social support; self-efficacy; mediation

Negative outcomes after *direct* exposure to traumatic events have been linked to psychological disorders including posttraumatic stress disorder (PTSD), represented by such symptoms as reexperiencing, avoidance, and hyperarousal (Brewin, Andrews, & Valentine, 2000). Secondary traumatic stress (STS), in comparison, is defined by the same set of symptoms resulting from *indirect* exposure to trauma (Bride, Robinson, Yegidis, & Figley, 2004). This indirect exposure is typified by healthcare providers working with traumatized individuals. The indirect exposure has been associated with many negative consequences including higher distress and increased negative cognitions (Pearlman & Mac Ian, 1995), higher job burnout (Ballenger-Browning et al., 2011), and lower job satisfaction (Devilly, Wright, & Varker, 2009).

In addition to the negative consequences of direct and indirect exposure to trauma, recent research has highlighted the importance of positive changes after exposure to trauma, such as meaning-making processes (Park & Ai, 2006) and posttraumatic growth (Cann et al., 2010). Building on the posttraumatic growth construct, Arnold and colleagues (2005) coined the term *vicarious posttraumatic growth*, referring to positive changes in schemas about self and the world

Study 1 was made possible by a research grant that was awarded to Charles C. Benight and administered by the U.S. Army Medical Research & Materiel Command (USAMRMC) and the Telemedicine & Advanced Technology Research Center (TATRC) at Fort Detrick, MD under Contract No. W81XWH-11-2-0153. Study 2 was supported by grant NN 106 139537 from the National Science Center awarded to Roman Cieslak and by Master Grant from the Foundation for Polish Science awarded to Aleksandra Luszczynska.

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and perceived psychological growth. Trauma-focused providers may experience this type of growth as a result of their work. Although we agreed with Arnold et al.'s conceptualization of vicarious posttraumatic growth, we have chosen to utilize the term *secondary traumatic growth* as it denotes more clearly the growth resulting from indirect exposure to trauma.

There is limited evidence for the relationships between STS and psychological growth variables among human services workers indirectly exposed to trauma. Positive associations between STS and secondary posttraumatic growth were found in studies enrolling mental health therapists (Brockhouse, Msetfi, Cohen, & Joseph, 2001) and disaster workers (Linley & Joseph, 2006). However, there are two primary limitations of these findings. First, the Brockhouse et al. (2001) study was cross-sectional. And, second, neither study utilized a theory-driven model to elucidate the underlying mechanisms related to posttraumatic growth. In this article, we reported on two studies that were longitudinal and based on social cognitive theory (Bandura, 1997).

Social Cognitive Theory as a Theoretical Framework

Social cognitive theory (SCT; Bandura, 1997) highlights bidirectional interactions between three sets of variables: the environment, individual factors, and behavior. Called triadic reciprocal determinism, this framework emphasizes self-regulation as a key mechanism for human adaptation. The triadic system functions through feedback processes operating internally (e.g., self-evaluations) and externally (changes in environmental conditions) and aims at recalibrating efforts toward desired outcomes (e.g., reduction of negative states). Self-efficacy is a critical appraisal factor that is central to the self-evaluative process. Social support operates as a primary environmental resource. We argue that social support and self-efficacy serve as key mediators in the association between STS and secondary traumatic growth.

Self-efficacy. Self-efficacy, in the context of traumatic stress, refers to perceived ability to manage environmental demands and personal functioning after adverse or traumatic experiences (Benight & Bandura, 2004). Through positive construal of challenging environmental demands, individuals are able to manage these demands in a more effective manner. Self-efficacy is related to lower levels of secondary traumatic distress in trauma counselors (Ortlepp & Friedman, 2002). Further, there is empirical evidence suggesting self-efficacy may play an important meditational role in the relationship between trauma exposure and psychological distress in disaster survivors (Benight, Ironson et al., 1999) and between stress appraisal and compassion satisfaction in rescue workers (Prati, Pietrantoni, & Cicognani, 2011).

We identified no studies examining the mediation effect of self-efficacy on the relationship between STS and secondary traumatic growth. However, based on well-documented mediating functions of self-efficacy in the context of direct traumatization (Cieslak, Benight, & Lehman, 2008), it may be assumed that self-efficacy would play a mediating role in the relationship between STS and secondary traumatic growth. In our studies, we hypothesized that self-efficacy would mediate the relationship between STS and secondary traumatic growth, with higher STS relating to lower self-efficacy and lower self-efficacy leading to lower secondary traumatic growth (Hypothesis 1).

Social support. Social support is a concept that refers to actual aiding resources provided by others (i.e., received social support) or to the perception of availability of aiding resources (i.e., perceived social support; Lin, 1986). Higher social support leads to lower negative consequences of direct traumatization (e.g., lower PTSD; Griffith, 2012) and higher positive changes after a traumatic event such as posttraumatic growth (Cieslak et al., 2009; Luszczynska, Sarkar, & Knoll, 2007). Similarly to self-efficacy, social support may be considered a mediator in the relationship between STS and secondary traumatic growth. Although we identified no research on the mediating role of social support in this relationship, there is evidence showing that social support mediates the relationship between posttraumatic distress symptoms and posttraumatic growth (Hogan & Schmidt, 2002). Therefore, we hypothesized that perceived social support would mediate the effect of STS on secondary traumatic growth. Specifically, higher secondary

traumatic stress would lead to lower perceived social support, and lower perceived social support would predict lower secondary traumatic growth (Hypothesis 2).

Cultivation and enabling hypotheses. Self-efficacy and social support have been defined in this investigation as mediators. Schwarzer and Knoll (2007), however, argued that the relationship between support and self-efficacy may be bidirectional. There are two alternative hypotheses explaining the relationship between self-efficacy and social support. The cultivation hypothesis suggests that self-efficacy facilitates social support, whereas the enabling hypothesis states that social support enhances and protects self-efficacy (Schwarzer & Knoll, 2007). Previous studies supporting the cultivation hypothesis showed that self-efficacy reduced depressive symptoms through the mediating effect of received social support (Schwarzer & Gutiérrez-Doña, 2005; Schwarzer & Knoll, 2007). In studies testing the enabling hypothesis, self-efficacy mediated the effect of perceived social support on distress (Benight, Swift et al., 1999) and quality of life (Amir, Roziner, Knoll, & Neufeld, 1999) and the effect of received social support on posttraumatic growth (Cieslak et al., 2009; Luszczynska et al., 2007).

Although both the cultivation and enabling hypotheses have been supported by empirical findings, no studies have examined these hypotheses in the context of indirect exposure to trauma. We hypothesized that the effect of STS on secondary traumatic growth would be mediated first by secondary trauma self-efficacy and then by perceived social support (Hypothesis 3, cultivating effect), and/or mediated first by perceived social support and then by self-efficacy (Hypothesis 4, enabling effect). All four hypotheses were tested in two longitudinal studies. Study 1 enrolled behavioral healthcare providers working with military patients suffering from trauma. Civilian healthcare providers offering services for trauma survivors took part in Study 2.

Study 1

Method

Participants. The study was a part of the SupportNet project, investigating predictors of secondary traumatic stress and job burnout among behavioral and mental healthcare providers working with the U.S. military personnel suffering from trauma. Inclusion criteria were a follows: (a) working for at least one year as a clinical psychologist, counselor, social worker, physician or nurse; (b) providing services for a military population; and (c) being indirectly exposed to trauma through interaction with patients. Of 310 respondents who completed the online survey at Time 1 (T1), 293 participants (98 males, 33.4%) were qualified for the present study based on the inclusion criteria. Of those who completed the T1 assessment, 115 participants (33 males, 28.7%) took part in Time 2 (T2) measurement 6 months later.

Table 1 displays the demographic characteristics. Participants experienced indirect exposure to different types of traumatic events through interaction with clients, including, for example, sudden unexpected death of someone close (89.4%), life-threatening illness or injury (88.1%), military combat (86.7%), sexual assault (84.3%), physical assault (82.6%), transportation accidents (80.9%), and natural disasters (66.6%). Additionally, all participants were directly exposed to trauma, with the average number of 3.23 (standard deviation [*SD*] = 1.90) traumatic events reported per person in a lifetime.

Measures. Participants completed a set of questionnaires evaluating STS, perceived social support, secondary trauma self-efficacy, and secondary traumatic growth. Indirect exposure to trauma and demographic variables were assessed as possible factors that should be controlled when testing the hypotheses.

Secondary traumatic stress. Secondary Traumatic Stress Scale (Bride et al., 2004) is a 17-item questionnaire used to measure the frequency of STS symptoms in the past month. It comprises the Intrusion subscale (five items), the Avoidance subscale (seven items), and the Arousal subscale (five items). The present study only used a total score of all items. Using a 5-point response scale, ranging from 1 (*never*) to 5 (*very often*), participants evaluated frequency

Table 1
Descriptive and Demographic Statistics for Study 1 and Study 2

Measure	Study 1 T1	Study 1 T2	Study 2 T1	Study 2 T2
Mean age (*SD*)	48.91 (12.83)	50.27 (12.59)	35.37 (8.48)	35.08 (8.12)
Gender				
Female	195 (66.6%)	82 (71.3%)	226 (75.8%)	150 (80.6%)
Male	98 (33.4%)	33 (28.7%)	69 (23.2%)	36 (19.0%)
Intimate relationship				
In a long-term relationship	224 (76.5%)	81 (70.4%)	219 (73.5%)	146 (77.2%)
Not in a long-term relationship	62 (21.2%)	31 (27.0%)	77 (25.8%)	42 (22.2%)
Highest degree				
High school	1 (0.3%)	0 (0%)	62 (20.8%)	35 (18.5%)
Associate's degree	1 (0.4%)	0 (0%)	-	-
Bachelor's degree	6 (2.0%)	2 (1.7%)	65 (21.8%)	37 (19.6%)
Master's degree	130 (44.4%)	55 (47.8%)	166 (55.7%)	114 (60.3%)
Doctorate degree	155 (52.9%)	58 (50.4%)	3 (1.0%)	1 (0.5%)
Profession				
	115 CP (39.2%)	41 CP (35.7%)	143 HCP (48.0%)	86 HCP (45.5%)
	77 counselors (26.3%)	27 counselors (23.5%)	113 SW (37.9%)	77 SW (40.7%)
	56 SW (19.1%)	21 SW (18.3%)	37 others (12.4%)	23 others (12.2%)
	35 HCP (11.9%)	7 HCP (6.1%)		

Note. T1 = Time 1, T2 = Time 2; SD = standard deviation; CP = clinical psychologist; HCP = healthcare provider; SW = social worker. Sample size for Study 1: $N_{T1} = 293$, $N_{T2} = 115$. Sample size for Study 2: $N_{T1} = 298$, $N_{T2} = 189$. Some percentages did not add up to 100% because of missing data. Long-term relationship included married couples and couples in a committed relationship.

of each symptom in relation to their work with patients who had been exposed to traumatic events. Sample items are "I felt emotionally numb" and "I felt jumpy." Cronbach's alpha was .94 for both T1 and T2 assessments.

Secondary trauma self-efficacy. Because there is evidence that the domain-specific measures of self-efficacy are more useful in predicting adaptation than are the general ones (Luszczynska, Scholz, & Schwarzer, 2005), we employed self-efficacy specific to STS. Secondary trauma self-efficacy is defined as the perceived ability to cope with the challenging demands resulting from work with traumatized clients and the perceived ability to deal with the secondary traumatic stress symptoms. Secondary Trauma Self-Efficacy Scale (Cieslak et al., 2013) is a 7-item questionnaire based on other self-efficacy instruments that were designed to measure perceived ability to cope with demands resulting from direct exposure to trauma and perceived ability to deal with posttraumatic stress symptoms (e.g., Lambert, Benight, Harrison, & Cieslak, 2012). Secondary trauma self-efficacy scale measures self-efficacy in the context of an *indirect* exposure to trauma. Participants rate the degree of perceived capability on a 7-point scale, ranging from 1 (*very incapable*) to 7 (*very capable*). The stem "How capable am I to . . . " is followed by such items as "deal with the impact these people have had on my life." Cronbach's alphas were .87 (T1) and .91 (T2).

Perceived social support. Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item questionnaire measuring availability of social support from family (four items), friends (four items), and broadly defined significant others (four items). A total score of all items was used in further analyses. The instruction was modified to measure perceived social support in the context of work-related demands in the past month. Participants rated the degree of agreement for each item on a 7-point scale, ranging from 1 (*very*

strongly disagree) to 7 (*very strongly agree*). Sample items are "I can talk about my problems with my friends" and "My family really tries to help me." Cronbach's alpha was .94 for both T1 and T2.

Secondary traumatic growth. Posttraumatic Growth Inventory-Short Form (PTGI-SF; Cann et al., 2010) was used to assess positive changes resulting from indirect exposure to trauma. The original PTGI-SF is a 10-item self-rated questionnaire that measures experience of significant positive change after a trauma. We modified the instruction by asking participants to rate the degree of change as a result of their *indirect* exposure to trauma through work with clients. A 6-point response scale ranged from 0 (*I did not experience this change*) to 5 (*I experienced this change to a very great degree*). Sample items are "I have a stronger religious faith" and "I established a new path for my life." Cronbach's alphas were .93 (T1) and .92 (T2).

Indirect exposure to trauma. Secondary Trauma Exposure Scale (Cieslak et al., 2013) was used to measure indirect exposure to traumatic events. It comprises a list of 10 potentially traumatic events (e.g., natural disasters, sexual assaults, military combat). Participants responded whether they were exposed to each event through their work with traumatized clients. Then they rated how frequently they worked with patients who experienced at least one of the potentially traumatic events on the list, using a 7-point scale, ranging from 1 (*never*) to 7 (*every day*).

Demographics. Demographic questions included age, gender, a relationship status, profession, and highest academic degree.

Procedure. The study was approved by the institutional review board (IRB) at the authors' institution. Providers who were located in the civilian community received the email with a link to the online survey through an online newsletter sent by TriWest Healthcare Alliance, an organization managing health benefits for military patients and their families. Providers located on military installations received the link to the survey in an email from the director of the Department of Behavioral Health at Evans Army Community Hospital at Fort Carson, Colorado, and from the Psychology Consultant to the U.S. Army Surgeon General at San Antonio, Texas. Respondents filled out the survey voluntarily, anonymously, and with no compensation for their time. Approximately 6 months later (mean [*M*] = 191.90 days, *SD* = 14.18), participants who agreed to take part in the T2 assessment received an email invitation to the online survey containing the same set of the questionnaires as in T1.

Analytical procedures. To test whether the data supported the cultivation hypothesis and/or enabling hypothesis, we performed multiple mediation analyses using PROCESS (Hayes, 2012). PROCESS permits for conducting multiple mediator regression analysis, accounting for covariates. Further, PROCESS allows for testing hypotheses assuming that mediators are chained together in a specific sequence (e.g., secondary traumatic stress [the independent variable] predicting social support [the first mediator], which in turn predicts self-efficacy [the second mediator], which predicts secondary traumatic growth [the dependent variable]).

Results of analyses are presented using three types of coefficients. A regression coefficient for each parameter is provided (see Figures 1 and 2). Further, PROCESS estimates the indirect effect coefficient (*B*) for each indirect pathway between the independent variable (STS at T1) and the dependent variable (secondary traumatic growth at T2), accounting for respective mediators and covariates. Bootstrapping method was used to test inferences about the significance of mediation effects (*B* coefficients). The bootstrap approach is considered superior to normal theory-based Sobel's test for the significance of the mediation (Hayes, 2012). Finally, we calculated partially standardized indirect effect size coefficients, ab_{ps} (Preacher & Kelley, 2011), for each indirect pathway.

To test the cultivation and enabling hypotheses as well as the hypotheses assuming simple mediating effects of self-efficacy and social support, we estimated *B* coefficients and confidence

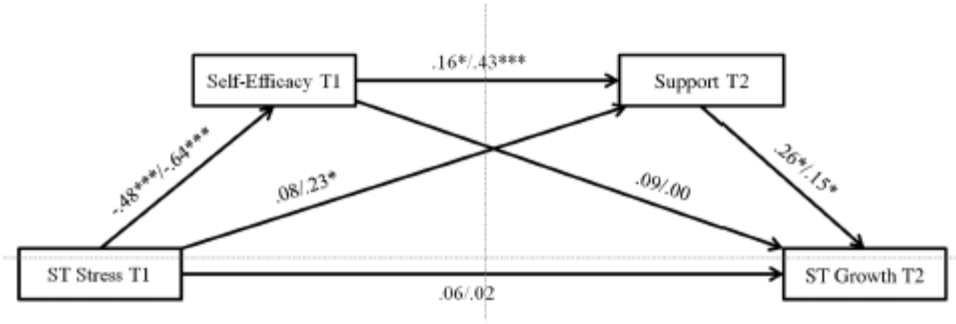

Figure 1. Model 1, referring to the cultivation hypothesis, being tested with the multiple mediation analysis. *Note.* A value before the slash is standardized regression coefficient (i.e., β) for Study 1, and value after the slash is β for Study 2. T1 = Time 1; T2 = Time 2; ST Stress = secondary traumatic stress; ST Growth = secondary traumatic growth. Additionally, the following effects were controlled in the analyses: (a) the effects of T1 indirect exposure on T1 secondary trauma self-efficacy ($\beta = -.10$, $p = .19$ for Study 1 and $\beta = .06$, $p = .27$ for Study 2), T2 social support ($\beta = .05$, $p = .42$ for Study 1 and $\beta = -.05$, $p = .45$ for Study 2), and T2 secondary traumatic growth ($\beta = -.11$, $p = .18$ for Study 1 and $\beta = -.06$, $p = .32$ for Study 2); (b) the effects of T1 social support on T1 self-efficacy ($\beta = .18$, $p = .03$ for Study 1 and $\beta = .15$, $p = .01$ for Study 2), T2 social support ($\beta = .77$, $p < .001$ for Study 1 and $\beta = .29$, $p < .001$ for Study 2), and T2 secondary traumatic growth ($\beta = -.11$, $p = .41$ for Study 1 and $\beta = .01$, $p = .83$ for Study 2); (c) the effects of T1 secondary traumatic growth on T1 self-efficacy ($\beta = .28$, $p < .001$ for Study 1 and $\beta = .13$, $p = .02$ for Study 2), T2 social support ($\beta = -.05$, $p = .44$ for Study 1 and $\beta = -.07$, $p = .28$ for Study 2), and T2 secondary traumatic growth ($\beta = .51$, $p < .001$ for Study 1 and $\beta = .58$, $p < .001$ for Study 2). Values displayed only for completers.
***$p < .001$. **$p < .01$. *$p < .05$.

intervals for *B*s using PROCESS. To obtain *B* for a specific indirect pathway, all variables, including the independent, mediators, dependent, and covariate variables, were entered into one equation. For the cultivation hypothesis (Model 1), secondary trauma self-efficacy (T1) and perceived social support (T2) were entered into the equation in a serial order to test if secondary trauma self-efficacy (T1) has a delayed effect on perceived social support (T2; see Figure 1). Indirect exposure to trauma (T1), perceived social support (T1), and secondary traumatic growth (T1) were entered into the equation as covariates. The enabling hypothesis model (Model 2) used the same set of assumptions and variables, except the sequential order of mediator variables was altered: perceived social support (T1) was assumed to predict secondary trauma self-efficacy (T2; see Figure 2). For the enabling hypothesis, indirect exposure to trauma (T1), secondary trauma self-efficacy (T1), and secondary traumatic growth (T1) were controlled for in the equation.

Missing data for all variables were replaced using the multiple imputation method (Schafer & Graham, 2002; Streiner, 2002). In the first step, data missing for those who completed both T1 and T2 was imputed. Secondary traumatic growth (T1 and T2), STS (T1 and T2), self-efficacy (T1 and T2), social support (T1 and T2) and secondary trauma exposure frequency (T1) were included in the regression method for multiple imputation. In total, 0.48% of the values at T1 and 0.23% of the values at T2 were replaced. In the second step, data missing for dropouts (55.46% of the T2 values) were imputed. Data obtained at T1, including exposure, support, efficacy, growth, STS, and sociodemographic variables as well as completer/dropout status were missing completely at random (MCAR), Little's $\chi^2(16) = 11.74$, $p = .76$. Analyses for T2 also confirmed MCAR pattern of missing data, Little's $\chi^2(6) = 4.25$, $p = .64$.

The analyses were conducted initially for completers. Next, we repeated the estimation of *B* coefficients, their confidence intervals, and effect sizes using data from completers and imputed data of those who dropped out at T2 (i.e., completers and dropouts).

Results

Preliminary analyses. Table 2 displays means, standard deviations, and Pearson's correlations of all variables measured at T1 and T2. Attrition analysis showed no significant differences

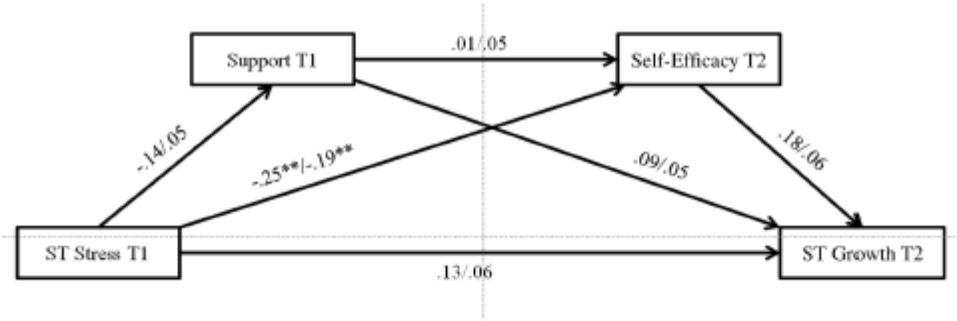

Figure 2. Model 2, referring to the enabling hypothesis, being tested with the multiple mediation analysis. *Note*. A value before the slash is standardized regression coefficient (i.e., β) for Study 1, and value after the slash is β for Study 2. T1 = Time 1; T2 = Time 2; ST Stress = secondary traumatic stress; ST Growth = secondary traumatic growth. Additionally, the following effects were controlled in the analyses: (a) the effects of T1 indirect exposure on T1 social support (β = .03, p = .72 for Study 1 and β = −.11, p = .14 for Study 2), T2 self-efficacy (β = .01, p = .92 for Study 1 and β = −.06, p = .31 for Study 2), and T2 secondary traumatic growth (β = −.10, p = .23 for Study 1 and β = −.07, p = .30 for Study 2); (b) the effects of T1 secondary trauma self-efficacy on T1 social support (β = .25, p = .03 for Study 1 and β = .27, p = .01 for Study 2), T2 self-efficacy (β = .48, p < .001 for Study 1 and β = .51, p < .001 for Study 2), and T2 secondary traumatic growth (β = .04, p = .69 for Study 1 and β = .04, p = .71 for Study 2); (c) the effects of T1 secondary traumatic growth on T1 social support (β = .09, p = .33 for Study 1 and β = .08, p = .29 for Study 2), T2 self-efficacy (β = .03, p = .68 for Study 1 and β = .01, p = .82 for Study 2), and T2 secondary traumatic growth (β = .50, p < .001 for Study 1 and β = .57, p < .001 for Study 2). Values displayed only for completers.
***$p < .001$. **$p < .01$. *$p < .05$.

between completers and dropouts in terms of STS at T1, $t(291) = 0.17$, $p = .87$; secondary trauma self-efficacy at T1, $t(291) = 0.29$, $p = .77$; perceived social support at T1, $t(291) = 0.08$, $p = .94$; secondary traumatic growth at T1, $t(291) = 1.25$, $p = .21$; indirect exposure to trauma, $t(291) = 0.65$, $p = .52$; age, $t(287) = 1.61$, $p = .11$; gender, $\chi^2(1) = 2.38$, $p = .12$; relationship status, $\chi^2(1) = 2.82$, $p = .09$; profession, $\chi^2(3) = 5.79$, $p = .12$; and education, $\chi^2(4) = 2.48$, $p = .65$.

Multiple mediation analyses. To test the four hypotheses, two multiple mediation models were analyzed. Model 1 was designed to verify Hypothesis 1 (with self-efficacy at T1 as a mediator), Hypothesis 2 (with social support at T2 as a mediator), and Hypothesis 3 (i.e., cultivation process). In Model 2, Hypotheses 1 and 2 were tested again (but with mediators measured at T2 and T1, respectively), and Hypothesis 4 (i.e., enabling process) was evaluated.

Model 1

First, data obtained from completers were analyzed. The multiple mediation analysis for Model 1 showed that Pathway 1, testing the simple mediation effect of secondary trauma self-efficacy at T1 (Hypothesis 1) and Pathway 2 testing the simple mediation role of perceived social support at T2 (Hypothesis 2), were not significant (Table 3).

Second, analyses conducted with dropout values imputed showed that Pathway 1 was significant (Table 3). In particular, higher STS (T1) was related to lower secondary trauma self-efficacy (T1), $\beta = -.60$, $p = .001$, and lower self-efficacy (T1) predicted lower secondary traumatic growth (T2), $\beta = .11$, $p = .04$. Furthermore, Pathway 2 was significant (Table 3). Higher STS (T1) explained higher perceived social support (T2), $\beta = .07$, $p = .06$, which in turn was associated with lower secondary traumatic growth (T2), $\beta = .32$, $p = .001$.

Testing for the cultivation hypothesis. When the completers' data were analyzed, Pathway 3 of Model 1 was significant, indicating that the cultivation hypothesis was supported (Table 3). Figure 1 shows standardized regression coefficients for each path in Model. After

Table 2
Means, Standard Deviations, Pearson's Correlations Among Study Variables for Study 1 and Study 2

Variable	1	2	3	4	5	6	7	8	9	Mean (*SD*) Study 1	Mean (*SD*) Study 2	*t*
1. Indirect exposure	–	.12*	.14	−.03	−.06	−.02	−.08	.10	.01	6.18 (1.03)	4.65 (1.72)	13.09***
2. STS T1	−.03	–	.79***	−.16**	−.10	−.65***	−.54***	−.06	−.05	1.88 (0.66)	2.32 (0.65)	9.21***
3. STS T2	.02	.76***	–	−.15*	−.20**	−.60***	−.61***	−.03	.01	1.78 (0.65)	2.28 (0.67)	6.38***
4. Social support T1	.11	−.34**	−.23*	–	.36***	.25***	.22**	.12*	.14	5.77 (1.07)	5.00 (1.50)	7.17***
5. Social support T2	.08	−.20*	−.27**	.80***	–	.34***	.36***	.02	.17*	5.68 (1.16)	5.02 (1.30)	4.47***
6. ST self-efficacy T1	.03	−.55***	−.45***	.33***	.37***	–	.65***	.15*	.16*	6.09 (0.77)	5.19 (0.94)	12.72***
7. ST self-efficacy T2	.05	−.49***	−.57***	.25**	.35***	.62***	–	.13	.14	6.18 (0.84)	5.23 (0.90)	9.15***
8. ST Growth T1	.11	.10	.18	.13*	.11	.13*	.13	–	.58***	2.35 (1.28)	2.97 (1.07)	6.39***
9. ST Growth T2	−.06	.06	.00	.19*	.25**	.25**	.23*	.55***	–	2.25 (1.29)	3.01 (0.98)	5.80***

Note. T1 = Time 1; T2 = Time 2; Indirect Exposure = indirect exposure to trauma; STS = secondary traumatic stress; ST Self-Efficacy = secondary trauma self-efficacy; ST Growth = secondary traumatic growth. Correlations below the diagonal show values for Study 1 ($N_{T1} = 293$, $N_{T2} = 115$). Correlations above the diagonal show values for Study 2 ($N_{T1} = 298$, $N_{T2} = 189$). Data presented for those who participated in Time 1 and Time 2 assessments.
***$p < .001$. **$p < .01$. *$p < .05$.

Table 3
Mediating Effects of Perceived Social Support and Secondary Trauma Self-Efficacy in the Relationship Between Secondary Traumatic Stress and Secondary Traumatic Growth

Indirect effects pathways	*B*	*SE*	BC 95% CI		Effect size
			Lower	Higher	ab_{ps}
Study 1: Model 1					
1. STS T1→ST self-efficacy T1→ST growth T2	−.079/ **−.088**	.095/ .043	−.289/ −.182	.081/ −.013	−.061/ −.088
2. STS T1→Support T2→ST growth T2	.042/ **.033**	.046/ .020	−.022/ .004	.171/ .088	.033/ .033
3. Cultivation hypothesis: STS T1→ST self-efficacy T1→ Support T2→ST growth T2	**−.041/ −.026**	.029/ .014	−.136/ −.064	−.002/ −.006	−.032/ −.026
Study 1: Model 2					
4. STS T1→ST self-efficacy T2→ST growth T2	**−.100/ −.064**	.056/ .026	−.231/ −.124	−.008/ −.018	−.077/ −.063
5. STS T1→Support T1→ST growth T2	−.030/ **−.042**	.045/ .025	−.163/ −.100	.021/ −.003	−.024/−.042
6. Enabling hypothesis: STS T1→Support T1→ST self-efficacy T2→ST growth T2	−.001/ −.000	.006/ .004	−.022/ −.009	.006/ .007	−.001/ .000
Study 2: Model 1					
7. STS T1→ST self-efficacy T1→ST growth T2	−.001/ −.011	.072/ .049	−.148/ −.093	.134/ .103	−.001/ −.009
8. STS T1→Support T2→ST growth T2	**.048/ .046**	.029/ .023	.008/ .013	.130/ .109	.048./ .053
9. Cultivation hypothesis: STS T1→ST self-efficacy T1→Support T2→ST growth T2	**−.058/ −.053**	.029/ .023	−.137/ −.110	−.015/ −.017	−.058/ −.060
Study 2: Model 2					
10. STS T1→ST self-efficacy T2→ST growth T2	−.016/ −.012	.025/ .017	−.081/ −.054	.023/ .016	−.016/ −.012
11. STS T1→Support T1→ST growth T2	.004/ .000	.012/ .010	−.009/ −.020	.051/ .021	.004/ .000
12. Enabling hypothesis: STS T1→Support T1→SE self-efficacy T2→ST growth T2	.000/ .000	.001/ .001	−.000/ −.001	.006/ .001	.000/ .000

Note. SE = standard error; T1 = Time 1; T2 = Time 2; STS = secondary traumatic stress; ST self-efficacy = secondary trauma self-efficacy; Support = perceived social support; ST growth = secondary traumatic growth. Values before the slash were calculated for completers. Values after the slash were calculated using data from completers and T2 dropouts whose values were imputed. Values of indirect effect coefficient (*B*) presented in bold are significant. Each bootstrap was based on 5,000 repetitions. Bias corrected (BC) confidence intervals (CI) that do not include zero indicate a significant indirect effect.

controlling for the effects of three covariates (i.e., T1 indirect exposure to trauma, T1 social support, and T1 secondary traumatic growth), high secondary traumatic stress (T1) was related to lower secondary trauma self-efficacy (T1), which in turn predicted lower social support (T2), and then lower social support (T2) was related to lower secondary traumatic growth (T2).

Similar results, confirming the cultivation hypothesis, were obtained when imputed data for dropouts were included in the analysis (Table 3). Again, Pathway 3 of Model 1 was significant.

Model 2

When data obtained from the completers were analyzed, the multiple mediation analysis for Model 2 showed that Pathway 4 was significant (Table 3). Higher STS (T1) predicted lower secondary trauma self-efficacy (T2), and lower self-efficacy (T2) was related to lower secondary traumatic growth (T2; see Figure 2). Pathway 5, testing the mediation effect of social support (T1), was not significant (Table 3) when the analyses were conducted just for completers.

In the analysis accounting for data from completers and imputed dropouts, Pathway 4 was significant (Table 3). High STS (T1) predicted low self-efficacy (T2), $\beta = -.21$, $p = .001$, and high self-efficacy (T2) was related to high secondary traumatic growth (T2), $\beta = .20$, $p = .01$. Pathway 5 was also significant (Table 3). Higher STS (T1) was associated with lower social support (T1), $\beta = -.21$, $p = .001$, which in turn predicted lower secondary traumatic growth (T2), $\beta = .11$, $p = .03$.

Testing for the enabling hypothesis. When data obtained from the completers were analyzed, Pathway 6, representing the enabling hypothesis, was not significant (Table 3). Figure 2 shows standardized regression coefficients for each path. The indirect effect testing enabling hypothesis was not significant when dropouts' imputed data were included in the analysis (Table 3). In sum, the enabling hypothesis was not supported.

Discussion

Results of Study 1 provided support for the cultivation hypothesis stating that secondary trauma self-efficacy facilitates perceived social support. These two variables constitute a specific order of chained mediators in the relationship between secondary traumatic stress and secondary traumatic growth. The enabling hypothesis was not supported. Further, analyses conducted for completers and analyses including imputed dropout values yielded similar results: The cultivation hypothesis should be accepted, whereas the enabling hypothesis should be rejected. Inconsistency of the results referring to the mediating function of self-efficacy (Hypothesis 1) and social support (Hypothesis 2) requires further investigation. In general, analyses provide tentative support for simple mediating effects of self-efficacy beliefs. The indirect effects of self-efficacy, obtained in simple mediation analysis, were larger than the indirect effects observed for social support. The findings of Study 1 should be replicated on a different sample to confirm that the findings are not specific for behavioral and mental healthcare providers working with traumatized military populations.

Study 2

To rectify the limitation of Study 1 related to a circumscribed client population, all hypotheses were tested again in a longitudinal study among professionals providing services to traumatized civilian populations. Additionally, these professionals were working within a different cultural context, in Poland. Thus, Study 2 was also designed to provide cross-cultural and clinical population validation of the initial findings.

Method

Participants. Healthcare and social workers providing services for civilian survivors of traumatic events were enrolled in the study. Inclusion criteria were (a) working at least one year

as a social worker or healthcare provider (e.g., physician, nurse, or paramedic); (b) providing services for a civilian population suffering from trauma; and (c) being indirectly exposed to trauma through interaction with clients. A total of 298 respondents (69 males, 23.2%) who met these criteria completed the online survey at T1. See Table 1 for sample demographic information. Participants were indirectly exposed to different types of traumatic events at work, including life-threatening illness or injury (89.3%), physical assault (87.6%), sudden unexpected death of someone close (82.6%), transportation accidents (73.5%), sexual assault (52.7%), and natural disasters (30.2%). Only 9.4% of participants were indirectly exposed to military-related trauma. Additionally, 77.9% of participants reported a lifetime direct exposure to a traumatic event. Of those who completed the T1 assessment, 189 participants (36 males, 19%) took part in the T2 measurement.

Measures. Respondents completed the same set of measures as in Study 1. These included (a) the Secondary Traumatic Stress Scale (αs = .91 for T1 and .93 for T2); (b) the Secondary Trauma Self-Efficacy Scale (αs = .89 for T1 and .88 for T2); (c) the Multidimensional Scale of Perceived Social Support (α = .96 for both T1 and T2); and (d) a modified version of the Posttraumatic Growth Inventory-Short Form (αs = .92 for Time 1 and .91 for Time 2). As in Study 1, only total scores were used for the questionnaires, and the indirect exposure to trauma was measured with one item (frequency of exposure) in the Secondary Trauma Exposure Scale. Instructions for all instruments were modified so that participants were asked to respond to the items in the context of work-related indirect exposure to trauma. The Polish versions of measures were prepared using the back-translation procedure.

Procedure. The study was approved by the IRB at the appropriate institution in Poland. Data were collected with a web-based survey. Participants were recruited through professional and online social networks dedicated to specialists working with traumatized clients. Those who volunteered were informed about the study aims, provided informed consent, and filled out the online questionnaires. If participants agreed to take part in the T2 survey, they received an e-mail invitation. The mean time that elapsed between the T1 and T2 was 162.04 days (SD = 39.72).

Analytical procedures. Missing data were replaced using the multiple imputation method with the same procedures as in Study 1 (Schafer & Graham, 2002; Streiner, 2002). As in Study 1, the data were missing completely at random at T1, Little's $\chi^2(12) = 14.73$, $p = .26$, and at T2, Little's $\chi^2(9) = 13.88$, $p = .13$. For completers-only analyses, 1.17% of the T1 values were replaced and 0.40% of the T2 values were replaced. When data for completers and dropouts were analyzed, 36.3% of the T2 values were replaced. A series of two multiple mediation analyses were performed using the same procedure and software as in Study 1.

Results

Preliminary analyses. Table 2 displays the means, standard deviations, and correlations for the study variables. Attrition analysis showed no significant differences between completers and dropouts at T1 in terms of STS, $t(296) = 0.61$, $p = .54$, secondary trauma self-efficacy, $t(296) = 0.57$, $p = .57$, perceived social support, $t(296) = 0.63$, $p = .53$, secondary traumatic growth, $t(296) = 0.86$, $p = .39$, indirect trauma exposure, $t(296) = 1.88$, $p = .06$, age, $t(269) = 0.76$, $p = .45$, intimate relationship status, $\chi^2(1) = 3.61$, $p = .06$, profession, $\chi^2(2) = 1.77$, $p = .41$, and education, $\chi^2(3) = 5.60$, $p = .13$. However, compared to dropouts, completers were more often women than men, $\chi^2(1) = 4.57$, $p = .03$.

Across the study variables' mean levels obtained by participants in Studies 1 and 2 were compared (see Table 2). In Study 1, respondents reported significantly higher frequency of indirect exposure to trauma, higher levels of social support (T1 and T2) and secondary trauma self-efficacy (T1 and T2), significantly lower secondary traumatic growth (T1 and T2), and lower STS (T1 and T2) compared to professionals enrolled in Study 2.

Multiple mediation analyses. The cultivation and enabling hypotheses as well as simple mediation hypotheses were tested with the same two multiple mediation models as in Study 1.

Model 1

First, data obtained from the completers were analyzed. Pathway 7, testing the simple mediation effect of T1 secondary trauma self-efficacy (Hypothesis 1), was not significant (Table 3). In contrast, the simple meditation effect of perceived social support (T2) was found to be significant in the relationship between STS at T1 and secondary traumatic growth at T2 (Hypothesis 2; see Table 3, Pathway 8). After accounting for the effects of three T1 covariates, STS (T1) predicted increased perceived social support (T2) 2, which in turn was associated with increased levels of secondary traumatic growth (T2; see Figure 1). Next, analyses were repeated with data obtained from completers and dropouts (after applying multiple imputation procedures). A similar pattern of results emerged (Table 3).

Testing for the cultivation hypothesis. When completers' data were analyzed, results of the multiple mediation analysis provided support for Hypothesis 3. Please refer to the confidence intervals for Pathway 9 in Table 3. After partialling out the effects of the three covariates, T1 STS was related to lower self-efficacy (T1), and then lower self-efficacy (T1) contributed to the lower level of social support (T2), which in turn was related to lower levels of secondary traumatic growth (T2; see Figure 2). Similar results, confirming the cultivation hypothesis, were obtained when imputed data for dropouts were included in the analysis (Table 3).

Model 2

Results of the simple mediation analysis (conducted for completers) indicated that neither secondary trauma self-efficacy (T2) nor perceived social support (T1) mediated the relationship between STS at T1 and secondary traumatic growth at T2 (see Table 3, Pathways 10 and 11). Similar results were obtained when imputed dropouts' data were included in the analysis (Table 3). Thus, Hypotheses 1 and 2 were not supported.

Testing for enabling the hypothesis. The analyses conducted for completers showed that Pathway 12, testing the enabling process (Hypothesis 4), was not significant (see Table 3). When imputed data for dropouts were included in the analysis, similar results for Pathway 12 were obtained (Table 3). The enabling hypothesis was not supported.

Discussion

In line with findings obtained in Study 1, results of Study 2 supported the cultivation hypothesis but not the enabling hypothesis. Further, analyses conducted for completers and analyses accounting for dropouts' imputed data yielded consistent results. There was no support for the hypothesis assuming simple mediating effect of self-efficacy, whereas the simple mediating effects of social support were found only if support was measured at T2 (at the same time when secondary traumatic growth was assessed).

General Discussion

This two-study investigation examined the indirect effects of STS on secondary traumatic growth via perceived social support and secondary trauma self-efficacy. These two mediators were assumed to operate either independently (Hypotheses 1 and 2) or sequentially, that is, with secondary trauma self-efficacy cultivating social support (Hypothesis 3), and/or social support enabling self-efficacy beliefs (Hypothesis 4). Taking into account the findings in both longitudinal studies, general support was obtained for the cultivation hypothesis in the context of the relationship between secondary traumatic stress and secondary traumatic growth.

The partial corroboration of Hypothesis 1 was found in Study 1 when self-efficacy was measured at T2 (Pathway 4); Hypothesis 2 was confirmed in Study 2 when social support was assessed at T2 (Pathway 8). These results, obtained for a group of completers, may suggest that self-efficacy and social support are more likely to mediate the STS—secondary traumatic growth relationship if these mediators are measured more closely to the time when a dependent variable is assessed. This observation needs further investigation because it may shed light on contradictory results of the cross-sectional studies testing the mediating effects of social support or self-efficacy (e.g., Lincoln, Chatters, & Taylor, 2005; Pietrzak et al., 2010).

Another matter requiring further attention is an explanation why we have found partial collaboration for Hypothesis 1 in Study 1 (i.e., for a simple mediating effect of self-efficacy) and for Hypothesis 2 in Study 2 (i.e., for a simple mediating effect of social support). The two primary differences between the two studies were the type of indirect exposure (military versus nonmilitary trauma) and the country where study was conducted (U.S. vs. Poland). Although we do not know if either of these factors may be responsible for the inconsistent results in our studies, there is empirical evidence that direct exposure to battlefield trauma may lead to different outcomes than other types of traumatic exposure, such as civilian terrorism, work, or traffic accidents (Amir, Kaplan, & Kotler, 1996). There is also evidence from studies on direct exposure to trauma that PTSD affects self-related cognitions, such as self-efficacy, more in individualistic cultures (typically Western countries) than in collectivistic cultures (typically Eastern countries; Jobson & O'Kearney, 2008). Moreover, collectivism may function through social support reducing negative consequences of trauma (Moscardino, Scimin, Capello, & Altoè, 2010). The type of indirect exposure and cultural values, such as individualism-collectivism, need to be investigated further as possible factors facilitating or hindering the effects of self-efficacy and social support.

Both studies show robust evidence supporting the cultivation hypothesis. In the context of the relationship between secondary traumatic stress and secondary traumatic growth, self-efficacy facilitated perceived social support when both mediating factors were contextualized in trauma-related work settings. Prior to our study, the cultivation hypothesis has not been tested in the context of secondary traumatization, and it has not been consistently confirmed in other research contexts (cf. Schwarzer & Knoll, 2007). An explanation for the supportive findings with the cultivation hypothesis is that the mediating factors measured were matched to the type of stressful event (i.e., indirect exposure) and the type of outcome (i.e., secondary traumatic growth; Kaniasty & Norris, 1992).

The findings regarding the cultivation hypothesis may have implications for SCT (Bandura, 1997). Social cognitive theory proposes that self-efficacy is a key factor facilitating adaptation in challenging situations. Our results suggest that enhancing self-efficacy helps a long-term adaptational process by facilitating social support. In contrast, enhancing social support without regard for perceptions of self-efficacy may have limited long-term effect on positive outcomes (e.g., perceptions of growth). These results indicate that the interplay between trauma-related consequences and environmental and individual factors may be time-sensitive. Other studies showed that social support may not affect distress one week after a traumatic event; however, it may reduce distress several weeks later (Cook & Bickman, 1990). Moreover, changes in self-efficacy a couple of weeks after trauma have shown to be predictive of subsequent distress 3 months later (Benight, Cieslak, Molton, & Johnson, 2008). Future studies need to consider the time sensitive nature of adaptation processes following indirect exposure to trauma.

The support for of the cultivation hypothesis obtained in both studies may have some practical implications for healthcare workers offering services for traumatized populations. As there are no doubts that offering these kinds of services leads to a higher risk of secondary traumatic stress (Bride et al., 2004), it is important to know what psychological processes may be involved in translating this negative outcome into a positive one (e.g., secondary traumatic growth). Healthcare workers who are at risk for indirect trauma exposure should be offered education about the importance of enhancing specific self-efficacy perceptions and about the role of efficacy beliefs in fostering secondary traumatic growth. However, education alone is rarely enough to promote self-efficacy (Bandura, 1997). Opportunities for skill attainment in the management of STS reactions combined with education will likely yield more empowerment and thus reduce the risk of a negative resource loss spiral (Hobfoll & Lilly, 1993).

Our research has some limitations. Although both of our studies were longitudinal, there were only two measurement points, whereas a four-wave investigation would be optimal to test a sequential multiple mediation model with two mediators. Regarding a methodological limitation related to a longitudinal design, the research procedures did not allow us to explain reasons for dropouts at T2. Furthermore, structural equation modeling could be used for testing the mediational hypotheses and comparing the goodness of fit for Models 1 and 2. Unfortunately, that would require a bigger sample size, which was difficult to achieve considering the specificity of investigated groups. Statistical procedures employed in this article allowed for a robust estimation of indirect effects with the optimal ratio between a sample size and the number of analyzed parameters. Although our assumption was that secondary traumatic growth is a positive outcome and reflects processes of adaptation after indirect exposure to trauma, there are studies indicating that posttraumatic growth may be dysfunctional (Luszczynska et al., 2012). Future investigation of this issue in the context of secondary traumatic growth is required.

Finally, recent research has highlighted the interplay among self-referent thoughts, the presence and absence of positive and negative social support, and secondary traumatic growth (McCormack, Hagger, & Joseph, 2011). Future investigation needs to account for presence (and absence) of both positive and negative support in the relationship between self-efficacy and secondary traumatic growth.

Summarizing, this is the first longitudinal two-study investigation of how social support and self-efficacy operate as mediators between secondary traumatic stress and secondary traumatic growth. Both studies consistently supported the cultivation hypothesis, indicating that self-efficacy being affected by secondary traumatic stress facilitates social support and this indirect pathway contributes to development of secondary traumatic growth.

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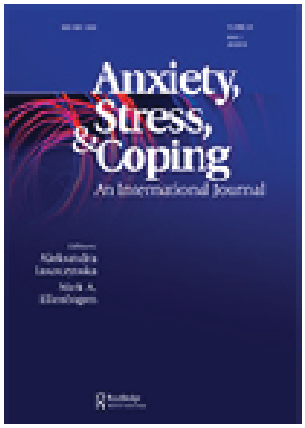
Appendix 2: Associations between job burnout and self-efficacy: A meta-analysis



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Associations between job burnout and self-efficacy: a meta-analysis

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REVIEW

Associations between job burnout and self-efficacy: a meta-analysis

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ABSTRACT

Background and Objectives: This study aimed at systematically reviewing and meta-analyzing the strength of associations between self-efficacy and job burnout (the global index and its components). We investigated whether these associations would be moderated by: (a) the type of measurement of burnout and self-efficacy, (b) the type of occupation, (c) the number of years of work experience and age, and (d) culture. **Design and Methods**: We systematically reviewed and analyzed 57 original studies ($N = 22,773$) conducted among teachers ($k = 29$), health-care providers ($k = 17$), and other professionals ($k = 11$). **Results**: The average effect size estimate for the association between self-efficacy and burnout was of medium size (−.33). Regarding the three burnout components, the largest estimate of the average effect (−.49) was found for the lack of accomplishment. The estimates of the average effect were similar, regardless of the type of measures of burnout and self-efficacy measurement (general vs. context-specific). Significantly larger estimates of the average effects were found among teachers (compared to health-care providers), older workers, and those with longer work experience. **Conclusions**: Significant self-efficacy–burnout relationships were observed across countries, although the strength of associations varied across burnout components, participants' profession, and their age.

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Burnout develops as a result of chronic stress in the work environment, when job requirements and workers' perceived abilities do not match (Brown, 2012; Maslach, Schaufeli, & Leiter, 2001). Burnout is found to be common in a number of human services occupations and it is often used as the indicator of poor well-being or a close correlate of employees' mental and physical health (Maslach et al., 2001). Recent meta-analyses showed that burnout was associated with work-related factors such as work hours or work setting (Lim, Kim, Kim, Yang, & Lee, 2010), and social support from co-workers (Kay-Eccles, 2012). Beyond the environmental contributors to burnout, individual and self-regulatory factors that serve as relevant resources in facilitating coping are also important to consider. These self-regulatory variables include locus of control, optimism, and self-efficacy (cf. Alarcon, Eschelman, & Bowling, 2009). Whereas burnout represents a crucial and one of the most frequently studied outcomes of job stress (Maslach et al., 2001), self-efficacy beliefs represent key modifiable cognitions that may protect workers from negative outcomes of job stress (Brown, 2012). This study provides a synthesis of evidence for the relationships between burnout and self-efficacy perceptions.

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Conceptualization and components of burnout

Burnout is most typically conceptualized as a three-component construct including exhaustion, depersonalization, and decreased personal accomplishment (Maslach et al., 2001). Since the three-component concept of burnout emerged, there has been an ongoing discussion on its content and validity (Demerouti, Bakker, Vardakou, & Kantas, 2003; Maslach et al., 2001; Schaufeli, Leiter, & Maslach, 2009). Although the labels of those three components have changed, their meaning remained the same: (1) exhaustion, representing a sense of weariness caused by a job; (2) depersonalization (or cynicism), referring to a detached attitude toward the job or clients; and (3) reduced personal or professional accomplishments, expressed in negative emotions and cognitions about own achievements and capacities to succeed at work or in life in general (Schaufeli et al., 2009). These three components are measured by the Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1996).

In contrast to the three-component approach by Maslach et al. (2001), others have argued that job burnout might best be reduced to a single common experience, namely exhaustion (cf. Malach-Pines, 2005). In contrast, the compassion fatigue framework defines burnout as a unidimensional construct encompassing a lack of well-being, negative attitudes toward work, or a lack of self-acceptance (Stamm, 2010).

The approach proposed by Maslach et al. (2001) assumes that all three burnout components are of equal importance. Furthermore, this approach assumes no major differences in origins of the three components, or the specificity of the interactions between the three components and other variables. However, recent systematic reviews and meta-analyses propose that some of the burnout components may form different associations with contributing factors of burnout. Significant associations were found more often when the exhaustion–self-efficacy relationship was analyzed than for personal accomplishments and self-efficacy (Brown, 2012). A review of studies conducted among professional athletes suggested that the associations between self-determination theory variables (autonomy, competence, and relatedness) and the three components of burnout were substantially different, with exhaustion forming weaker associations (−.22 to −.26) compared to the associations found for personal accomplishments (−.38 to −.64) (Li, Wang, Pyun, & Kee, 2013). In contrast, meta-analyses conducted among employees of different occupations did not show differences in the relationships between the three burnout components and personality characteristics (including core self-evaluations, the five-factor model characteristics, and affectivity variables; Alarcon et al., 2009). In sum, the differences in associations between job burnout and self-regulatory variables require further examination. The differences may result from conceptualization and operationalization of burnout, but also from the characteristics of the studied populations (e.g. the type of occupation).

Self-efficacy and its associations with burnout

Besides demonstrating a wide range of negative consequences of work-related stress, researchers and professionals have begun to advocate for analyzing the role of protective factors (Kay-Eccles, 2012; Voss Horrell, Holohan, Didion, & Vance, 2011). These protective factors may refer to the characteristics of the work environment (e.g. organizational structure, safety standards) or individual variables (e.g. self-efficacy, age, optimism) which have established associations with burnout (Alarcon et al., 2009; Lee, Seo, Hladkyj, Lovell, & Schwartzmann, 2013). Environmental characteristics or individual difference variables (such as organizational structures or age) are difficult to change (cf. Voss Horrell et al., 2011). In contrast, cognitions such as self-efficacy are modifiable protective factors.

According to social cognitive theory self-efficacy refers to individuals' beliefs in their capability to exercise control over challenging demands (Bandura, 1997). In the context of occupational stress, self-efficacy represents the confidence that one can employ the skills necessary to deal with job-specific tasks and cope with job-specific challenges, job-related stress, and its consequences.

Self-efficacy is usually defined and measured as a domain-specific construct but it may be conceptualized and measured in a more general (or global) way, as the belief in one's competence to cope with a broader range of stressful or challenging demands (Luszczynska, Scholz, & Schwarzer, 2005). A general approach to self-efficacy provides an opportunity to assess self-efficacy in a parsimonious way, when researchers investigate general stress adaptation (Luszczynska et al., 2005).

Social cognitive theory assumes that self-efficacy determines various stress-related outcomes (Bandura, 1997) and burnout is an example of such an outcome. Employees with low self-efficacy are likely to harbor pessimistic thoughts about their future accomplishments and personal development (Luszczynska & Schwarzer, 2005). Those assumptions form the theoretical background for the association between self-efficacy and burnout. Self-efficacy and stress outcome indicators, such as personal accomplishment, are conceptually distinct (cf. Luszczynska & Schwarzer, 2005). The construct of personal accomplishment (and its measure) is of retrospective character and it represents the outcomes of actions (e.g. "accomplished many worthwhile things" or "feel exhilarated after work"), whereas self-efficacy beliefs are of prospective and operative character (i.e. refer to potential abilities of an individual and their future actions).

Research conducted in the context of stress shows that self-efficacy may operate as a resource preventing negative consequences of strain (cf. Blecharz et al., 2014). Self-efficacy prompts recovery from job stress (Hahn, Binnewies, Sonnentag, & Mojza, 2011), and efficacy beliefs were found to facilitate employees' adaptation to changes in the organization (Jimmieson, Terry, & Callan, 2004). Experimental studies demonstrated that a self-efficacy-enhancing intervention reduced employees' strain (Unsworth & Mason, 2012).

Two systematic reviews, which employed meta-analysis to analyze the relationship between self-efficacy and burnout components, yielded different results. Alarcon et al. (2009) identified 12 studies and found that the strongest associations were observed for self-efficacy and personal accomplishments among workers of various professions. In contrast, Brown (2012) showed that among teachers the associations between burnout and personal accomplishments emerged less frequently than the associations between self-efficacy and the two other burnout components. The two reviews did not test for the potential moderators (such as the occupation type) of these associations or for the differences in the associations between self-efficacy and burnout components. The differences between these two meta-analyses, in terms of analyzed population, operationalization, and the measurement of self-efficacy and burnout, could affect the obtained results. Brown (2012) focused on teachers and accounted for both general and specific self-efficacy, whereas Alarcon et al. (2009) did not account for the type of profession and included only studies that tested the role of general self-efficacy. Furthermore, the limitation of the two reviews refers to the conceptualization of burnout: both studies excluded data obtained with measures other than MBI; therefore it is hard to evaluate if the operationalization of burnout may affect its relationship with personal resource variables. The purpose of this review is to evaluate this literature by taking into account these previous limitations.

The moderators of burnout–self-efficacy associations

Social cognitive theory assumes that self-efficacy tied to specific aspects of stressful encounters, barriers, and outcomes will demonstrate stronger associations with stress outcomes than self-efficacy that is conceptualized and measured in a general way (Bandura, 1997). Therefore, the overarching synthesis of relationships between self-efficacy and burnout should account for the operationalization of both burnout and self-efficacy. Meta-analyses accounting for burnout showed that there are significant differences in the relationships between burnout and stress-related variables: these differences depend on the operationalization/assessment of burnout (Cieslak et al., 2014).

Social cognitive theory assumes that the associations between self-efficacy and stress outcomes (e.g. burnout) should be similar across populations, regardless of age, gender, or culture (Bandura, 1997), but depend on individual past experiences. For example, the relationship between self-efficacy and stress outcomes would be moderated by whether an individual has had many opportunities to

exercise mastery over stressful workplace challenges. It is possible that age and years of work experience represent proxy indicators of such opportunities to exercise mastery. Therefore, characteristics of employees, such as their age or the number of years of work experience, are potential moderators.

Several systematic reviews and meta-analytical studies investigating determinants of burnout highlighted the role of other individual characteristics or contextual factors, such as type of occupation or culture/countries of data collection. For example, the type of profession and country/culture significantly moderated the associations between burnout and work-related or individual risk factors (Lee et al., 2013) and the associations between burnout and other mental health outcomes (for systematic review, see Cieslak et al., 2014). Meta-analyses conducted for data obtained among teachers yielded stronger burnout–personal accomplishment associations (Brown, 2012) than analyses conducted among workers with other occupations (Alarcon et al., 2009). Therefore, the effect of the type of occupation on the burnout–self-efficacy association needs to be clarified.

The concepts of burnout and self-efficacy were developed in the USA, and a large proportion of studies investigating the associations between these constructs were conducted in North America. However, it is often indicated that research should provide more in-depth analysis on cross-national differences of the effects of job stress (such as burnout) and its determinants: the assumption that Western concepts and theories transcend cultural and national boundaries may be not valid (cf. Perrewé et al., 2002). Furthermore, critical determinants of negative outcomes of job stress (such as burnout) include existing work-related policies, social resources at work, and organizational characteristics (Voss Horrell et al., 2011). These critical determinants are likely to vary across countries and occupations.

In sum, the operationalizations of the self-efficacy and burnout constructs as well as individual variables (the number of years of work experience, age, culture/the country of origin, and occupation) may affect self-efficacy–burnout associations. The present study extends the existing literature by evaluating the burnout–self-efficacy relationship in the context of socio-demographic and operationalization-related moderators.

Aims of the study

Although evidence for the relationships between job burnout and workers' self-efficacy is accumulating, there is no overarching synthesis of these relationships, accounting for different professions and different operationalizations of the two related constructs. Whereas burnout is one of the key outcomes in occupational stress research, self-efficacy represents a crucial personal resource. Therefore, this study aimed at systematically reviewing and meta-analyzing the strength of associations between self-efficacy and job burnout (the global index and its components). We investigated if these associations would be moderated by: (a) the type of measurement of job burnout and self-efficacy, (b) the type of occupation, (c) the number of years of work experience and age, and (d) employees' culture or country.

Method

Literature search

We conducted a database search of independent studies examining self-efficacy and job burnout that were available before 2013 using Search Complete, Agricola, Business Source Complete, ERIC, Medline, PsychARTICLES, PsychINFO, Science Direct, SocINDEX, and Web of Knowledge. Combinations of the keywords that were used in this search were terms related to self-efficacy ("self-efficac*") and job burnout ("burnout", "burn out", and "burn-out"). Authors of original studies were asked to provide statistical information when the articles did not provide necessary information (e.g. Pearson's coefficient, Cronbach's α) to be included in this study. In addition, manual reviews of

article references were conducted. We used the Cochrane systematic review methods (Higgins & Green, 2008).

Inclusion criteria, exclusion criteria, and data extraction

The inclusion criteria were: (a) self-efficacy and job burnout were measured; (b) the relationship between self-efficacy and burnout was assessed, or authors provided appropriate statistics upon request; (c) articles reported statistics that could be converted into Pearson's coefficient (e.g. *t*-test, *F*-test, χ^2, Cohen's *d*); and (d) participants of original studies were employees (research conducted among students were not included). We included only studies reported in English, although the measurement used in studies could be in non-English languages. Studies applying qualitative methods, reviews, research on non-workers (e.g. student samples), dissertations, and book chapters were excluded.

When two or more studies used the same sample, only one study with the larger sample size was included (Schwarzer & Hallum, 2008). Therefore, to avoid dependence of effect sizes, one study was excluded because it shared the same sample as another study. When multiple studies using different samples were reported in a paper, each study was included as an independent study.

If the individual studies are of low quality and the synthesis is conducted without any consideration of quality then the results of the review and meta-analysis may be biased (Glasziou, Irwig, Bain, & Colditz, 2001). The low scoring obtained in quality tools is often used as the exclusion criterion in systematic reviews (Glasziou et al., 2001). Therefore, we applied the quality criteria based on a quality measure proposed by Kmet, Lee, and Cook (2004). Five quality criteria were used (Kmet et al., 2004): (a) measurement reliability (whether internal reliability of measurements was reported or the applied measures of burnout and self-efficacy had good reliability established in earlier research on psychometric properties of respective scales); (b) potential confounders were considered and addressed in the study; (c) a clear description of participants' selection procedures was provided; (d) basic demographics of a sample (age and gender) were reported; and (e) the objectives of a study were sufficiently described. Only studies representing at least moderate quality (i.e. meeting at least 60% of the criteria; Kmet et al., 2004) were included. As a result, four studies were excluded.

Figure 1 displays the selection process. The initial search resulted in 214 studies. A total of 60 studies meeting all inclusion and quality criteria were identified. In the next step, we excluded studies yielding extreme effect sizes, which are likely to produce a radical increase in a standard deviation that results in an inaccurate estimate of a cumulative effect size (Hunter & Schmidt, 2004). Removing extreme effect sizes can increase the accuracy of the estimate. To tackle this issue we used a procedure based on *z*-scores. Three studies were excluded because they were identified as outliers based on the criteria with *z*-scores greater than 10 or less than −10 (Pietrantoni & Prati, 2008; Schwarzer & Hallum, 2008 (German sample only); Schwerdtfeger, Konermann, & Schönhofen, 2008), which indicated that the effect sizes reported in these studies were ±10 standard deviations from the estimate of the average effect. As a result, we included 57 original studies in further analyses (see Table 1).

Two researchers (ES and AR) extracted descriptive data for each study including the sample size, socio-demographic characteristics, and the study design. Next, they retrieved data constituting moderators: the type of self-efficacy and burnout measures, countries where studies were conducted, languages used where the studies were conducted, occupation of the sample, mean age of the sample, and the number of years of work experience. Statistical information, including Cronbach's α and measures of association, was also extracted.

Coding

Data constituting moderators were coded independently by three researchers (ES, AR, and RC or KS). Overall, the concordance of the coding for moderator variables was high. All values of the kappa

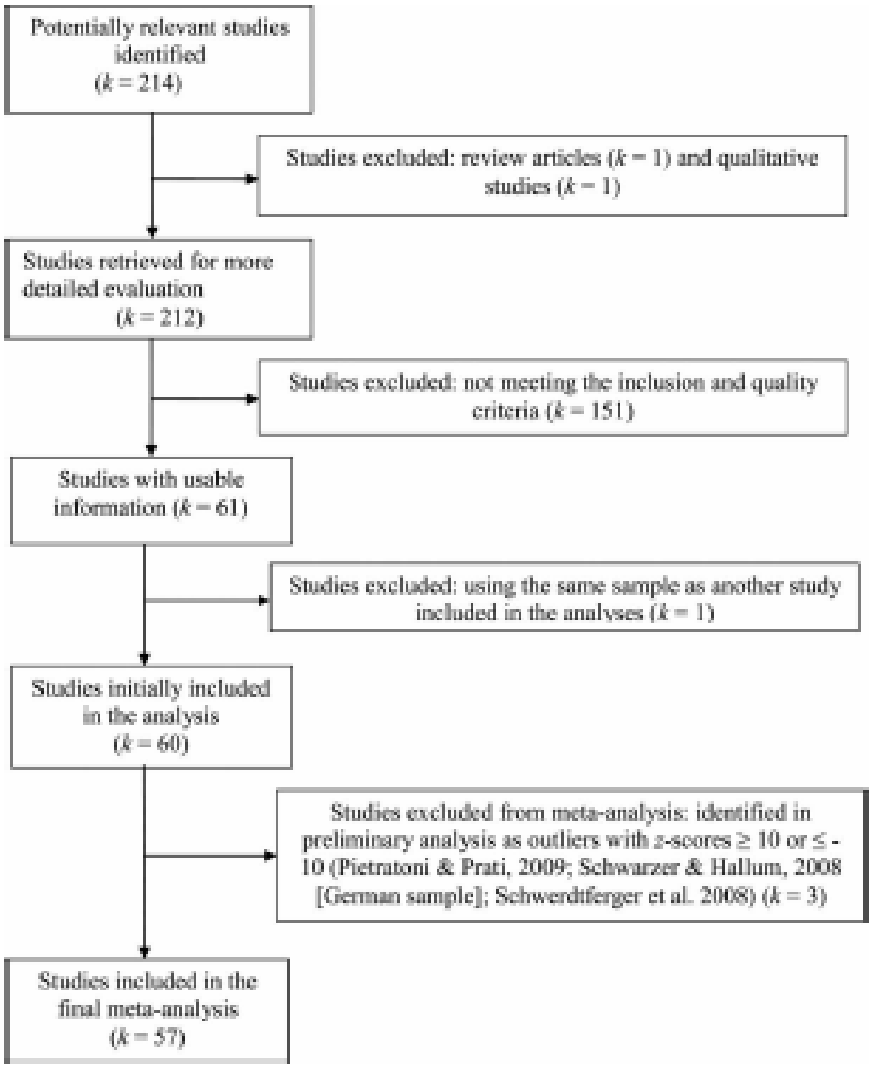

Figure 1. Selection of studies for the meta-analysis.

coefficient were above .89 ($p < .01$). Disagreements related to data selection and abstraction were resolved by a consensus method (searching for possible rating errors, followed by a discussion, and arbitration by a third researcher; Higgins & Green, 2008).

The studies were divided based on measurements used for job burnout: (a) MBI-related measurements such as MBI-General Survey (Schutte, Toppinen, Kalimo & Schaufeli, 2000), MBI-Educators Survey (Maslach et al., 1996), and MBI-Human Service Survey (Maslach & Jackson, 1981) or (b) non-MBI-related measurements such as the Utrechtse Burnout Schaal (Schaufeli & van Dierendonck, 2000), the Professional Quality of Life Scale (Stamm, 2005), Burnout Scale (Blase, 1982), and the Bergen Burnout Indicator (Matthiesen & Dyregrov, 1992).

Original studies were divided based on measurements for self-efficacy: (a) general self-efficacy measurements (Chen, Gully, & Eden, 2001; Chesney, Chambers, Taylor, Johnson, & Folkman, 2003; Jerusalem & Schwarzer, 1992; Schwarzer, 1993; Sherer et al., 1982; Zunz, 1998) or (b) context-specific self-efficacy measurements (e.g. Self-Efficacy Scale for Classroom Management and Discipline, Emmer &

Table 1. Summary of the studies included in the meta-analysis.

Study	*N* (% females)	Mean age (SD)	Mean work experience (SD)	Occupation (occupation group)	Country (language)	Study design	JB measure (*α*)	SE measure (*α*)	*r*
Baker, O'Brien, and Salahuddin (2007)	123 (100)	36.97 (9.48)	5.92 (4.70)	Shelter workers (OG 2)	USA (English)	CS	MBI (EE = .87, DP = .52, PA = .68)	[a]GSES (.87), [a]SES (.76)	−.348
Berryhill, Linney, and Fromewick (2009)	100 (19)	39.3	13.1	Health-care workers (OG 2)	USA (English)	CS	MBI (EE = .90, DP = .70, PA = .79)	[b]Short TES (.77)	−.408
Betoret (2006)	247 (47)	–	–	Teachers (OG 1)	Spain (Spanish)	CS	Scale by authors (range: .71–.78)	[b]Scale by authors (.80)	−.360
Betoret (2009)	725 (63)	–	–	Teachers (OG 1)	Spain (Spanish)	CS	MBI (EE = .86, DP = .76, PA = .83)	[b]TPTS (.84), [b]TPSE (.87)	−.465
Boyd, Lewin, and Sager (2009)	495 (27)	–	–	Sales workers (OG 3)	USA (English)	CS	MBI (EE = .80)	[b]Chowdhury (1993) (.73)	−.410
Bragard, Etienne, Merckaert, Libert, and Razavi (2010)	96 (64)	28.2 (2.6)	3 (2.05)	Medical residents (OG 2)	Belgium (French)	L	MBI (EE = .94, DP = .81, PA = .77)[c]	[b]Parle, Maguire and Heaven (1997) (subscales: .85, .79)	−.154[c]
Briones, Tabernero, and Arenas (2010)	68 (60)	43.56 (10.93)	17.15 (11.97)	Teachers (OG 1)	Spain (Spanish)	CS	MBI (EE = .85, PA = .71)	[b]TSES (.90)	−.364
Brouwers and Tomic (2000)	243 (74)	46.29	21.25 (8.92)	Teachers (OG 1)	The Netherlands (Dutch)	L	MBI (T1: EE = .91, DP = .72, PA = .86; T2: EE = .92, DP = .71, PA = .86)	[b]SES for CMD (T1: .89, T2: .90)	−.598
Brouwers, Evers, and Tomic (2001)	277 (25)	45.87 (8.82)	21.28 (9.74)	Teachers (OG 1)	The Netherlands (Dutch)	CS	MBI (EE = .90, DP = .71, PA = .85)	[b]TSES (subscales: .94, .92)	−.396
Brouwers, Tomic, and Boluijt (2011)	311 (30)	41.19 (11.05)	18.85 (11.29)	Teachers (OG 1)	The Netherlands (Dutch)	CS	MBI (EE = .91, DP = .74, PA = .83)	[b]Scale by authors (.79)	−.352
Brudnik (2009)	402 (77)	38.4	13.6	Teachers (OG 1)	Poland (Polish)	CS	MBI (EE = .87, DP = .77, PA = .75)[d]	[a]GSES (.86)[d]	−.347
Burke, Matthiesen, and Pallesen (2006)	496 (92)	–	–	Nursing home workers (OG 2)	Norway (Norwegian)	CS	BBI (.90)	[a]GSES (.85)	−.171
Chan (2007)	267 (63)	27.5	4.67 (3.84)	Teachers (OG 1)	HK (English)	CS	MBI (EE = .87, DP = .67, PA = .79)	[b]SETH (.75)	−.322
Chan (2008)	159 (62)	27.06	6.98 (7.02)	Teachers (OG 1)	HK (English)	CS	MBI (EE = .88, DP = .65, PA = .78)	[b]TSES-24 (subscales range: .79–.92), [a]GSES (.83)	−.379
Cicognani, Pietrantoni, Palestini, and Prati (2009)	764 (28)	34	9.38 (7.36)	Emergency room workers (OG 2)	Italy (Italian)	CS	ProQOL R-IV (.86)	[b]PPE (.77)	−.205

(*Continued*)

Table 1. Continued.

Study	*N* (% females)	Mean age (SD)	Mean work experience (SD)	Occupation (occupation group)	Country (language)	Study design	JB measure (*a*)	SE measure (*a*)	*r*
Davidson et al. (2010)	258 (33)	56	17	University workers (OG 3)	Israel, NZ, USA	Quasi EX	MBI (EE = .86)	[a]Scale by authors (.87)	−.243
Devos, Bouckenooghe, Engels, Hotton, and Aelterman (2007)	46 (39)	–	–	Primary school principals (OG 1)	Belgium (Dutch)	CS	MBI (.94)	[a]GSE (.85)	−.553
Duffy, Oyebode, and Allen (2009)	61 (74)	42.6 (14)	11.8 (9.1)	Care home workers for elderly with dementia (OG 2)	UK (English)	CS	MBI (EE = .90, DP = .79, PA = .71)	[b]IGNSE (.96)	−.498
Egyed and Short (2006)	106 (89)	43 (10.83)	13.77 (9.45)	Teachers (OG 1)	USA (English)	CS	MBI (ranges: .72–.89)	[b]TES (subscales: .78, .75)	−.061
Eisele and D'Amato (2011)	599 (85)	46.6 (10.5)	–	Health-care workers (OG 2)	Sweden (Swedish)	CS	MBI (EE = .79, DP = .60, PA = .71)	[a]GSE (.86)	−.332
Emold, Schneider, Meller, and Yagil (2011)	39 (92)	40.9	15.8 (10.75)	Oncology nurses (OG 2)	Israel (Hebrew)	CS	MBI (EE = .86, DP = .80, SA = .56)	[b]Scale by authors (.87)	−.357[c]
Evers, Brouwers, and Tomic (2002)	490 (23)	47.23	22.14 (8.86)	Teachers at the study-home system (OG 1)	The Netherlands (Dutch)	CS	MBI (EE = .90, DP = .68, PA = .83)	[b]Scale by authors (subscales: .68, .85, .80)	−.515
Evers, Tomic, and Brouwers (2005)	271 (35)	45.57 (8.39)	18.99 (9.25)	Teachers (OG 1)	The Netherlands (Dutch)	CS	MBI (EE = .87, DP = .70, PA = .80)	[a]GSES (.79)	−.433
Friedman (2003)	322 (94)	37.62 (0.50)	12.9 (0.51)	Teachers (OG 1)	Israel (Hebrew)	CS	MBI (EE = .90, DP = .79, PA = .82)	[b]Scale by authors (subscales: .62, .74, .79, .82)	−.277
Gibson, Grey, and Hastings (2009)	81 (94)	25.5	1.33 (1.2)	Therapists (OG 2)	Ireland (English)	CS	MBI (EE = .85, DP = .65, PA = .80)	[b]PTSE (.89)	−.346
Grau, Salanova, and Peiró (2001)	140 (46)	33 (8.05)	–	New technology workers (OG 3)	Spain (Spanish)	CS	MBI (EE = .82, DP = .86)	[a]GSES (.81), [a]MBI PE scale (.70)	−.122
Greenglass and Burke (2000)	1363 (95)	42	13.31 (7.68)	Nurses (OG 2)	Canada (English)	CS	GBQ (EE = .90, DP = .82, PE = .73)	[a]GSES (.87)	−.238
Howard, Rose, and Levenson (2009)	82 (57)	40 (11.45)	–	Various workers dealing with people with intellectual disabilities (OG 2)	UK (English)	CS	MBI (EE = .82, DP = .60, PA = .80)	[b]DBSES (.94)	−.264
Laugaa, Rascle, and Bruchon-Schweitzer (2008)	410 (74)	42.01 (8.5)	18.53 (10.63)	Teachers (OG 1)	France (French)	L	MBI (EE = .85, DP = .67, PA = .78)	[a]GSES (.75)	−.344
Lee and Akhtar (2007)	2267 (89)	–	–	Nurses (OG 2)	HK (Chinese)	CS	MBI (EE = .90, DP = .82, PA = .78)	[a]GSES (.87)	−.205
Lu (2007)	135 (78)	32.28	–	Nurses (OG 2)	Philippines (English)	CS	MBI (.76)	[a]GSES (.93)	−.228

Nota, Ferrari, and Soresi (2007)	146 (58)	34.75 (7.31)	11.9 (9.1)	Social and health-care professionals (OG 2)	Italy (Italian)	CS	MBI (EE = .90, DP = .79, PA = .71)	[b]Scale by authors (subscales range: .84–.90)	–.184
Ozdemir (2007)	523 (66)	38.15 (6.95)	13.77 (7.60)	Teachers (OG 1)	Turkey (Turkish)	CS	MBI (EE = .83, DP = .71, PA = .72)	[b]SES for CMD (.90)	–.513
Pas, Bradshaw, Hershfeldt, and Leaf (2010)	641 (96)	–	8.45 (8.62)	Teachers (OG 1)	USA (English)	L	MBI (EE = .90)	[b]TES (.84)	–.207
Petitta and Vecchione (2011)	142 (26)	–	–	Workers at a nuclear physics institute (OG 3)	Italy (Italian)	CS	MBI (EE = .87, DP = .82, PE = .76)	[b]Scale by authors (.81)	–.553
Pisanti, Lombardo, Lucidi, Lazzari, and Bertini (2008)	1383 (77)	39.1	–	Nurses (OG 2)	Italy (Italian)	CS	MBI (EE = .88, DP = .72, PA = .82)	[b]OCSE-N (subscales: .77, .79)	–.292
Prati, Pietrantoni, and Cicognani (2010)	451 (31)	33.66 (10.05)	9.04 (7.27)	Rescue units' workers (OG 2)	Italy (Italian)	CS	ProQOL R-IV (.79)	[b]PPE (.79)	–.367
Pugh, Groth and Hennig-Thurau (2011)	528 (45)	36.5 (10.55)	5.6 (6.4)	Customer service workers (OG 3)	UK (English)	CS	Scale by authors (.88)	[b]Scale by authors (.90)	.045
Ransford, Greenberg, Domitrovich, Small, and Jacobson (2009)	133 (92)	40.73 (12.04)	15 (11.43)	Teachers (OG 1)	USA (English)	CS	MBI (.86)	[b]TES (.64)	–.458
Salanova, Grau, Cifre, and Llorens (2000)	140 (46)	–	–	Computer technology specialists (OG 3)	Spain (Spanish)	CS	MBI (EE = .89, DP = .87)	[b]Scale by authors (.79)	–.180
Salanova, Peiró, and Schaufeli (2002)	405 (51)	32 (8.07)	–	Computer technology specialists (OG 3)	Spain (Spanish)	CS	MBI (EE = .85, DP = .82)	[a]GSES (.85), [b]CSE (.71)	–.273
Schwarzer, Schmitz, and Tang (2000)	261 (71)	–	–	Teachers (OG 1)	HK (Chinese, English)	CS	MBI (EE = .88, DP = .79, PA = .83)	[a]GSES (.84)	–.370
Schwarzer and Hallum (2008)	608 (85)	–	–	Teachers (OG 1)	Syria (Arabic)	CS	MBI (EE = .83, DP = .71, PA = .78)	[a]GSES (.87), [b]TES (.80)	–.452
Shyman (2010)	100 (89)	–	–	Paraeducators (OG 1)	USA (English)	CS	MBI (.61)	[b]TES (.49)	–.494
Skaalvik and Skaalvik (2007)	244 (63)	45	14.3 (10.85)	Teachers (OG 1)	Norway (Norwegian)	CS	MBI (EE = .79, DP = .61, PA = .79)	[b]NTSES (subscales range: .74–.91); [b]Scale by authors (.79)	–.410
Skaalvik and Skaalvik (2010)	2249 (68)	45	–	Teachers (OG 1)	Norway (Norwegian)	CS	MBI (EE = .88, DP = .70)	[b]NTSES (subscales range: .77–.91)	–.433
Tang, Au, Schwarzer, and Schmitz (2001)	269 (68)	37.09 (9.78)	9.5 (9.76)	Teachers (OG 1)	HK (Chinese)	CS	MBI (EE = .87, DP = .80, PA = .84)	[a]GSES (.81)	–.348
*Tang et al. (2001)	61 (62)	30.36 (5.76)	6.41 (4.28)	Teachers (OG 1)	HK (Chinese)	L	MBI (T1: EE = .89, DP = .77; T2: EE = .90, DP = .83)	[a]GSES (.84)	–.359
Tatar (2009)	281 (78)	–	13.84 (9.25)	Teachers (OG 1)	Israel (Hebrew)	CS	MBI (.80)	[b]TES (subscales: .81, .71)	.224[c]

(*Continued*)

Table 1. Continued.

Study	*N* (% females)	Mean age (SD)	Mean work experience (SD)	Occupation (occupation group)	Country (language)	Study design	JB measure (*α*)	SE measure (*α*)	*r*
Tsouloupas, Carson, Matthews, Grawitch, and Barber (2010)	610 (86)			Teachers (OG 1)	USA (English)	CS	MBI (EE = .89)	[b]PSECM (.94)	−.251
Vlăduț and Kállay (2011)	177 (87)	39.8 (9.5)	–	Teachers (OG 1)	Romania (Romanian)	CS	MBI (.65)	[b]TSES (.93)	−.532[c]
Volker et al. (2010)	383 (63)	37.82	2.45 (1.25)	Addiction therapists (OG 2)	EU	L	MBI (EE = .85, DP = .71, PA = .74)	[a]GSES (.82)	−.354
Weingardt, Cucciare, Bellotti, and Lai (2009)	147 (62)	47 (9.6)	–	Counsellors (OG 2)	USA (English)	EX	MBI (.75)[c]	[b]PEQ (.93)[c]	−.095[c]
Wilk and Moynihan (2005)	429 (80)	38 (11)	8.4 (9)	Call center supervisors (OG 3)	USA (English)	CS	MBI (EE = .78)	[b]JSE (.89)	−.288
Xanthopoulou, Bakker, Demerouti, and Schaufeli (2007)	714 (17)	42 (9.4)	14 (10.2)	Electrical engineers (OG 3)	The Netherlands (Dutch)	CS	MBI (EE = .88)	[a]GSES (.86)	−.149
Yu, Lin, and Hsu (2009)	205 (28)	–	–	High-tech IT workers (OG 3)	Taiwan (Chinese)	CS	MBI (EE = .86, DP = .89, PE = .66)	[a]Bosscher and Smith (1998) (.74)	−.243
Zunz (1998)	101 (69)	42.7	–	Human service managers (OG 3)	USA (English)	CS	MBI (EE = .89, DP = .73, PA = .80)	[b]Scale by authors (.85)	−.609

Note: Study = first author and year of publication; *N* (% females) = sample size and percentage of females; CS = cross-sectional study; L = longitudinal study; EX = experimental study; JB = job burnout; SE = self-efficacy; T1 = Time 1; T2 = Time 2; TES = Teacher Efficacy Scale; TPTS = teacher-perceived teaching self-efficacy; GSES = General Self-efficacy Scale; SES = Self-efficacy Scale; TPSE = teacher-perceived self-efficacy in classroom management; TISES = Teacher Interpersonal Self-efficacy Scale; SES for CMD = Self-efficacy Scale for Classroom Management and Discipline; SETH = Self-efficacy Toward Helping Scale; TSES-24 = Teacher Self-efficacy Scale; PPE = perceived personal efficacy for members of volunteering associations; IGNSE = inventory of geriatric nursing self-efficacy; PTSE = Perceived Therapeutic Self-efficacy Scale; DBSES = Difficult Behaviour Self-efficacy Scale; OCSE-N = Occupational Coping Self-efficacy Questionnaire for Nurses; CSE = computer self-efficacy; NTSES = Norwegian Teacher Self-efficacy Scale; PSECM = Perceived Self-efficacy in Classroom Management Questionnaire; TSES = Teachers' Sense of Efficacy Scale; PEQ = Provider Efficacy Questionnaire; JSE = job self-efficacy; MBI = Maslach Burnout Inventory with subscales; BBI = Bergen Burnout Indicator; EE = emotional exhaustion; DP = depersonalization; PA = personal accomplishment; CY = cynicism; PE = professional efficacy; SA = self-actualization; ProQOL R-IV = Professional Quality of Life Scale Revision IV-Burnout Scale; GBQ = General Burnout Inventory; OG 1 = occupation group (teachers); OG 2 = occupation group (health-care workers); OG 3 = occupation group (others).

[a]General self-efficacy measure.

[b]Specific self-efficacy measure.

[c]Information not reported in the article, but provided on the authors' request.

[d]Information retrieved from psychometric studies.

Hickman, 1991; Inventory of Geriatric Nursing Self-Efficacy, Mackenzie & Peragrine, 2003; Self-Efficacy Toward Helping Scale, Schwarzer, 1993; Teacher Self-Efficacy Scale, Skaalvik & Skaalvik, 2007; Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). The general self-efficacy measures assessed beliefs about abilities to deal with various challenging demands across a variety of stressful situations. The context-specific measurement accounted for workers' confidence that one can employ the skills necessary to deal with job-specific tasks, cope with job-specific challenges, or deal with stress and its consequences.

Lastly, moderation factors were created based on regions where the study had been conducted (western countries [e.g. the USA, Spain, the Netherlands] vs. other countries [e.g. China, Philippines, Turkey]), languages spoken where studies were conducted (English vs. other languages [14 other languages]), and occupations of the sample (health-care providers vs. teachers vs. other services).

Data analysis

The estimates of the average effect, heterogeneity, and effect of the moderators on the relationship between self-efficacy and job burnout were examined using Comprehensive Meta-Analysis software (version 2.2.064; Borenstein, Hedges, Higgins, & Rothstein, 2005). The statistical analysis followed the procedure described by Hunter and Schmidt (2004). The estimates were computed using the random-effect model method (Field & Gillett, 2010).

Pearson's correlation was used as the effect size indicator. If the original study provided only statistical analyses other than Pearson's correlation, those statistics were converted into Pearson's correlations. When the original study provided multiple Pearson's correlations between self-efficacy and job burnout (e.g. for separate subscales), a mean correlation coefficient was calculated. Partial correlation coefficients or beta coefficients were not considered. The direction of a correlation involving the MBI personal accomplishment subscale was reversed to create negative associations between self-efficacy and burnout. When a study used a measurement of general self-efficacy and a context-specific self-efficacy measure, we included a Pearson's correlation between context-specific self-efficacy and burnout in the calculation of a cumulative effect size. In line with social cognitive theory (Bandura, 1997), context-specific self-efficacy is considered a more proximal predictor of specific outcomes, such as burnout. In analyses testing the role of burnout (when no specific burnout component was investigated) the total scores of the respective burnout measure (all components) were used.

Overall, correlations were directly synthesized to form the estimate of the effect size without transforming into Fisher's *z*. The correction for attenuation due to the measurement error was obtained by dividing the correlation coefficient (for self-efficacy–burnout association) by the geometric mean of the reliability coefficients (Cronbach's α coefficients for self-efficacy and burnout measures). Cronbach's α coefficients were retrieved from the original studies. If the original study provided αs for subscales only, a mean Cronbach's α for a total score was calculated. When no α was available, it was obtained from psychometric studies (Gibson & Dembo, 1984; Luszczynska, Gutiérrez-Doña, & Schwarzer, 2005; Maslach & Jackson, 1981). In sum, we corrected for attenuation due to measurement errors for an effect size from each study using the method described by Hunter and Schmidt (2004) but we did not calculate the ρ coefficient which requires the correction of artifacts (such as restriction of range) on a weighted mean *r* (Hunter & Schmidt, 2004).

Heterogeneity of the data included in the meta-analysis was tested using a Q-statistic. The Q-statistic evaluates how effect sizes scatter on a χ^2 distribution (Cochran, 1954). Between-studies data heterogeneity was also evaluated with I^2, which measures the percentage of variability in the observed effect estimates that is due to between-studies heterogeneity rather than chance. Furthermore, τ^2 reflecting the actual amount of variation (the between-studies variance) was reported.

In the moderation analysis an estimate of the average effect was calculated for each level of the moderators, and group mean effect sizes were compared using the Q_B statistic. Q_B was used as an omnibus test for detecting between-groups differences for categorical moderator variables

(Hedges & Pigott, 2004). A significant Q_B score indicates that the estimates of the average effect are different from each other. For continuous moderator variables such as age and the number of years of work experience, meta-regression analyses were conducted using the mean age and mean number of years of work experience in each study (Borenstein et al., 2005). In these analyses Q_B was used to indicate the significance of the effect of the continuous moderator variables. A significant Q_B value suggests that estimates of the effect size were predicted by these variables.

To address the file drawer problem, robustness of the calculated estimate of the average effect against the effect of unpublished null results was assessed using the fail-safe *N* test (Rosenthal, 1979). In this test the number of unpublished studies that were necessary to produce a nonsignificant result was calculated.

Results

Description of the analyzed material

Table 1 displays information about the samples, procedures, and measurements applied in the 57 original studies. The analysis included 22,774 participants. A sample size for each study varied from 39 to 2267 participants, with an average of 399.54 (SD = 453.74) and a median of 267. Data were collected in various professional groups including teachers (50.88%; $k = 29$), health-care providers (29.82%; $k = 17$), and other services workers such as call center workers and information technology specialists (19.30%, $k = 11$). The mean age was 39.10 years (SD = 6.38; range = 25.50–56.00). The mean number of years of work experience was 12.16 years (SD = 5.59; range = 1.33–22.14). The studies enrolled from 17% to 100% of women ($M = 63.12\%$, SD = 23.71%); only one original study was homogeneous in terms of gender.

Associations between job burnout and self-efficacy

The meta-analysis conducted for 57 original studies yielded the estimate of the average effect of −.33 (95% CI: −.365, −.288, $\tau^2 = .022$; Table 2), for associations between self-efficacy and burnout. The estimate of the average effect between self-efficacy and emotional exhaustion (−.31; 95% CI: −.342, −.268, $\tau^2 = .013$) was similar to the estimate of the average effect for the relationship between self-efficacy and depersonalization (−.33; 95% CI: −.374, −.275, $\tau^2 = .026$). The largest estimate of the average effect (−.49; 95% CI: −.554, −.414; $\tau^2 = .070$), was found for the relationship between self-efficacy and reduced personal accomplishment. When applying the most often used measure of moderation, such as the overlap of confidence intervals (Hunter & Schmidt, 2004), the estimates found for personal accomplishment can be interpreted as significantly larger than those observed for two other components of burnout.

The type of measurement as the moderator

To examine the effect of burnout measurement type on the estimate of the average effect, studies were divided into two groups: (a) MBI-related measurement (87.7%) or (b) measurement other than MBI-related (12.3%; Table 2). The moderation analysis showed a similar size of the estimates of the average effect in studies using the MBI-related measurement and in studies using other measurements, $Q_B(1) = 2.70$, $p = .10$.

The original studies were divided into two categories on the basis of the type of measurement used to assess efficacy beliefs: (a) general self-efficacy (31.6%) or (b) self-efficacy specific for the work-related contexts (68.4%; Table 2). Context-specific self-efficacy referred to beliefs about the ability to deal with job-specific tasks, cope with job-specific challenges, or deal with job-related stress and its consequences. Results of the moderation analysis showed that there was no significant difference in the estimates of the average effect calculated for associations between burnout and either (a) general self-efficacy or (b) context-specific self-efficacy, $Q_B(1) = 2.53$, $p = .11$.

Table 2. Results of meta-analysis of the relationship between self-efficacy and job burnout: overall and moderator effects.

	Range of correlation coefficients (*r*) retrieved from original studies	The estimate of the average effect (weighted *r*)	95% CI for the estimate of the average effect	*n*	*k*	Heterogeneity		Sampling bias estimation: fail-safe *N*
						Q	I^2%	
Overall effects								
SE–JB	−.609 to .224	−.327	−.365 to −.288	22,774	57	540.40***	89.64	29,608
SE–exhaustion	−.549 to .007	−.306	−.342 to −.268	16,492	42	239.03***	82.85	12,985
SE–depersonalization/cynicism	−.561 to −.050	−.325	−.374 to −.275	16,201	39	427.29***	91.11	14,157
SE–lack of accomplishment	−.836 to −.068	−.487	−.554 to −.414	12,798	35	860.68***	96.05	24,721
Moderator								
JB measure								
MBI measures	−.609 to .224	−.338	−.377 to −.298	18,879	50	422.65***	88.41	23,688
Other measures	−.553 to .045	−.246	−.348 to −.139	3895	7	63.92***	90.61	324
SE measure								
General SE	−.553 to −.122	−.288	−.330 to −.244	9416	18	64.44***	73.62	2536
Specific SE	−.609 to .224	−.342	−.394 to −.286	13,357	39	427.55**	91.11	14,773
Occupation								
Teachers	−.598 to .224	−.377	−.427 to −.324	10,601	29	247.37***	88.68	10,482
Health-care providers	−.498 to −.095	−.264	−.302 to −.224	8618	17	43.61***	63.31	1948
Other	−.609 to .045	−.280	−.382 to −.171	3557	11	113.36***	91.18	634
Country								
Western	−.609 to .045	−.335	−.378 to −.291	16,590	41	364.17***	89.02	16,520
Other	−.519 to .224	−.305	−.408 to −.195	5397	13	186.07***	93.55	1261
Language								
English	−.609 to .045	−.306	−.372 to −.237	5661	19	123.14***	85.38	5661
Other	−.598 to .224	−.338	−.385 to −.290	16,594	36	389.01***	91.00	15,115

Notes: SE = self-efficacy; JB = job burnout; 95% CI = critical intervals for the weighted effect size, *n* = sample size; *k* = number of studies. A significant *Q* value indicates that the data are heterogeneous, suggesting that the variability among studies was not due to sampling error. An I^2% value indicates the percentage of variance due to heterogeneity among studies. A fail-safe *N* value indicates the number of studies with null results that are necessary to overturn the results of the meta-analysis and to conclude that the results are due to sampling bias.

*$p < .01$.

**$p < .01$.

***$p < .001$.

Type of occupation as the moderator

To examine whether the type of occupation affected the estimate of the average effect for the relationship between self-efficacy and burnout, studies were divided into three groups: (a) health-care providers (29.8%), (b) teachers (50.9%), or (c) other services' workers (19.3%; Table 2). The moderation analysis showed that the size of the estimates of the average effect depended on the type of occupation, $Q_B(2) = 11.54$, $p < .01$. Follow-up tests indicated that the estimates found for teachers were larger than those for health-care providers, $Q_B(1) = 11.40$, $p = .001$, and were no different from estimates of the average effect for other occupations, $Q_B(1) = 2.70$, $p = .10$. There was no significant difference in the size of the estimates of the average effect found for health-care providers, compared to other services' occupations, $Q_B(1) = 0.08$, $p = .78$.

Mean age and the number of years of work experience as moderators

The effects of age and the number of years of work experience were examined using a meta-regression. Fifteen studies that did not report the mean age of the sample were excluded, resulting in 42 original studies included in this analysis. Results of the meta-regression showed that age was significantly related to the estimate of the average effect for the self-efficacy–burnout relationship, $B = -.009$, $SE = .002$, $z = -5.76$, $Q_B(1) = 33.22$, $p < .001$. The self-efficacy–burnout associations were stronger among older workers than among younger workers.

Next, we examined whether the number of years of work experience at the current occupation influenced the estimates of the average effect for the self-efficacy–burnout relationship. Twenty-three studies did not report the mean years of work experience; therefore, these studies were excluded, resulting in 34 studies included in this analysis. Results of the meta-regression analysis showed that work experience was significantly related to the average effect size estimate for the self-efficacy–burnout relationship, $B = -.014$, $SE = .002$, $z = -7.37$, $Q_B(1) = 54.36$, $p < .001$. The burnout–self-efficacy associations were stronger among participants with a higher number of years of work experience than among participants with a lower number of years of work experience.

Culture and language as the moderators

To analyze the moderating effect of regions where studies were conducted, original studies were classified into two groups: (a) Western culture (71.9%) or (b) other cultures (22.8%; Table 2). Studies that included samples from both Western cultures and other cultures were exduded from this analysis. Similar estimates of the average effect were found in the Western culture and other cultures, $Q_B(1) = 0.43$, $p = .51$.

Finally, original studies were divided into two types of primary languages spoken in countries where studies were conducted: (a) English (33.3%) or (b) non-English languages (63.2%; Table 2). In this analysis, studies were excluded when the location where they were conducted was not identifiable. A moderation analysis showed that similar estimates of the average effect were found for English-speaking countries and for non-English-speaking countries, $Q_B(1) = 0.60$, $p = .44$.

Discussion

The present study adds to the existing literature by indicating the coexistence of high levels of self-efficacy and low levels of job burnout among professionals of various occupations. The meta-analysis of 57 studies suggested that the association between these two constructs was moderate. The findings might indicate that self-efficacy plays a protective factor role against the components of burnout and/or that low levels of burnout may contribute to higher self-efficacy.

The results showed that self-efficacy forms different associations with the three components of burnout. The differences in the relationships contribute to the discussion on the internal structure of the job burnout construct, as they may be indicative of different processes through which protective factors (such as self-efficacy) may form associations with burnout components. Thus, the findings

may be interpreted as supporting the assumptions made by Maslach et al. (2001), suggesting that job burnout consists of three distinct components.

Emotional exhaustion is often indicated as the core component of job burnout (Malach-Pines, 2005). Furthermore, there are conceptual proposals to focus on exhaustion and depersonalization components and to exclude personal accomplishments from the components of burnout (Schaufeli & Bakker, 2004). These proposals emerged as the result of a research paradigm that focused on investigating the risk factors for burnout (Greenglass & Burke, 2001). In contrast, the results of the present study suggest that personal accomplishments should not be disregarded as a burnout component, as it may form the strongest links with modifiable personal resource variables, such as self-efficacy. Thus, the personal accomplishments component may be particularly relevant in studies focusing on individual protective factors, guided by such theoretical approaches as social cognitive theory (Bandura, 1997).

Our findings suggest that compared to other burnout components personal accomplishments form the strongest associations with self-efficacy. These results are in line with another meta-analysis focusing on individual protective factors. This analysis showed that autonomy, competence, and relatedness form the strongest associations with personal accomplishments, compared to the other burnout components (Li et al., 2013). In an argument for the association between self-efficacy and personal accomplishments, Schaufeli and Bakker (2004) proposed that these two variables overlap conceptually. It has to be noted that our meta-analysis suggests that the two variables share a modest amount of variance.

The associations between burnout and self-efficacy were similar, regardless of the type of self-efficacy measured (general vs. specific, related to the task at hand). Future research may need to further evaluate the role of types of self-efficacy, because subtle differences in the conceptualization and measurement of self-efficacy may determine the strength of its association with important health-related outcomes (cf. Burkert, Knoll, Scholz, Roigas, & Gralla, 2012).

We found significant differences between the occupational groups in the self-efficacy–burnout associations. In particular, the associations were stronger for teachers than for health-care providers. So far, systematic reviews either focused on one occupational group (Brown, 2012; Li et al., 2013) or did not account for the moderating effect of the occupation (Alarcon et al., 2009). The strongest associations found for teachers indicate that this occupational group may particularly benefit from interventions enhancing self-efficacy beliefs. Future research needs to continue investigating occupation-specific protective factors that are likely to form strong associations with lower levels of burnout.

The meta-regression results indicate that the strongest associations between burnout and self-efficacy occurred among older individuals or those with more work experience. Previous systematic reviews showed that older age or more years of work experience may be related to lower levels of burnout (Brewer & Shapard, 2004). Our meta-analysis results provide insights into the interpretation of these associations. Older workers have a better established link between the protective beliefs about their own ability to deal with stressful events and lower burnout. They may be more likely to use this protective resource effectively, in order to lower their burnout. Future research needs to identify the modifiable protective factors that help to explain burnout levels in younger and less experienced workers.

The estimates of the average effect were similar across the cultures. This finding has an implication for practice: interventions aiming at burnout preventions and addressing self-efficacy may have similar effects in male and female workers, from both Western and non-Western cultures.

The present study has its limitations. The original studies were mostly cross-sectional in design. No causal conclusions regarding the self-efficacy and burnout relationship can be made. Although we have identified a relatively large number of original studies, the majority of them used MBI as the measure of burnout and enrolled teacher samples. Other measures of burnout were rarely used, and therefore we could not conduct a thorough comparison across the conceptualizations of burnout. Compared to studies on teachers, a low number of studies were conducted among other

homogeneous occupational groups (e.g. social care workers). Therefore, comparisons conducted between occupational groups should be considered as preliminary. Gender may moderate the effects of work stress (Biron & Link, 2014) and the associations between self-efficacy and health among workers (Cieslak et al., 2014); therefore its effects should be considered in future reviews. Across burnout components, the strongest associations with self-efficacy were obtained for the subscale of burnout which is positively worded (i.e. personal accomplishment subscale). Future meta-analyses may need to systematically test for the effects of item directionality. Finally, we investigated the role of only one personal resource variable (self-efficacy). Future studies need to establish if associations between burnout and other variables representing modifiable personal resources may form equally strong or even stronger associations. Identifying the strongest predictors of low levels of burnout may have implications for health promotion in organizations.

Regardless of its limitations, our study offers novel evidence for the relationship between self-efficacy and burnout. Significant associations between these two variables were observed across countries, professions, and age groups. Differences in these relationships indicate that larger estimates of average effects were found among teachers, older individuals, and those with more years of work experience. Furthermore, we provided preliminary support for the notion of the three-component structure of the burnout, demonstrating that the associations between burnout and self-efficacy may vary, depending on the evaluated burnout component.

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Note: References marked with an asterisk indicate studies included in meta-analysis.

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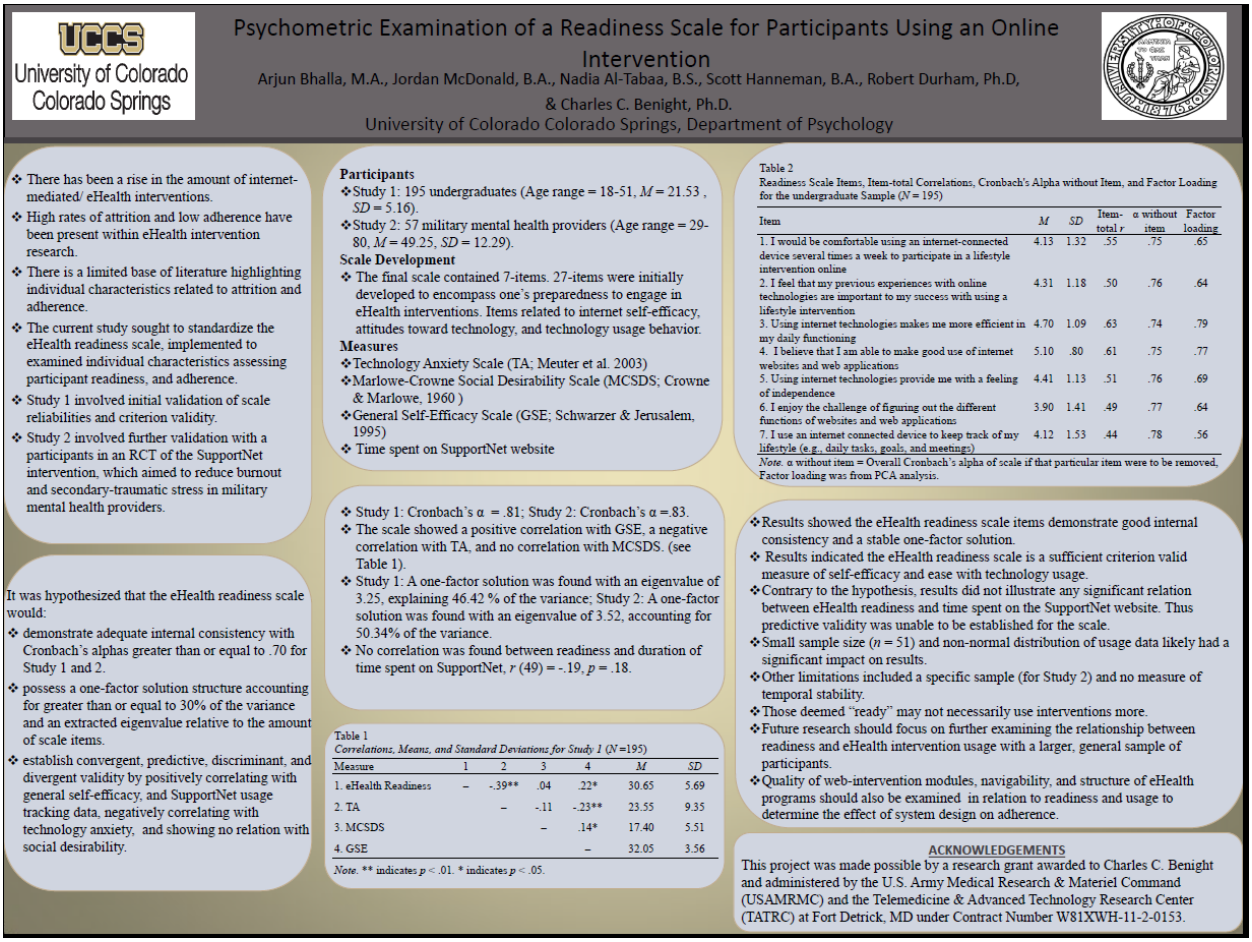
Appendix 3: Psychometric examination of a readiness scale for an RCT of an online intervention.



Psychometric Examination of a Readiness Scale for Participants Using an Online Intervention

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- There has been a rise in the amount of internet-mediated/ eHealth interventions.
- High rates of attrition and low adherence have been present within eHealth intervention research.
- There is a limited base of literature highlighting individual characteristics related to attrition and adherence.
- The current study sought to standardize the eHealth readiness scale, implemented to examined individual characteristics assessing participant readiness, and adherence.
- Study 1 involved initial validation of scale reliabilities and criterion validity.
- Study 2 involved further validation with a participants in an RCT of the SupportNet intervention, which aimed to reduce burnout and secondary-traumatic stress in military mental health providers.

It was hypothesized that the eHealth readiness scale would:

- demonstrate adequate internal consistency with Cronbach's alphas greater than or equal to .70 for Study 1 and 2.
- possess a one-factor solution structure accounting for greater than or equal to 30% of the variance and an extracted eigenvalue relative to the amount of scale items.
- establish convergent, predictive, discriminant, and divergent validity by positively correlating with general self-efficacy, and SupportNet usage tracking data, negatively correlating with technology anxiety, and showing no relation with social desirability.

Participants

- Study 1: 195 undergraduates (Age range = 18-51, $M = 21.53$, $SD = 5.16$).
- Study 2: 57 military mental health providers (Age range = 29-80, $M = 49.25$, $SD = 12.29$).

Scale Development

- The final scale contained 7-items. 27-items were initially developed to encompass one's preparedness to engage in eHealth interventions. Items related to internet self-efficacy, attitudes toward technology, and technology usage behavior.

Measures

- Technology Anxiety Scale (TA; Meuter et al. 2003)
- Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960)
- General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995)
- Time spent on SupportNet website

- Study 1: Cronbach's α = .81; Study 2: Cronbach's α = .83.
- The scale showed a positive correlation with GSE, a negative correlation with TA, and no correlation with MCSDS. (see Table 1).
- Study 1: A one-factor solution was found with an eigenvalue of 3.25, explaining 46.42 % of the variance; Study 2: A one-factor solution was found with an eigenvalue of 3.52, accounting for 50.34% of the variance.
- No correlation was found between readiness and duration of time spent on SupportNet, $r\,(49) = -.19$, $p = .18$.

Table 1
Correlations, Means, and Standard Deviations for Study 1 (N =195)

Measure	1	2	3	4	*M*	*SD*
1. eHealth Readiness	–	-.39**	.04	.22*	30.65	5.69
2. TA		–	-.11	-.23**	23.55	9.35
3. MCSDS			–	.14*	17.40	5.51
4. GSE				–	32.05	3.56

Note. ** indicates $p < .01$. * indicates $p < .05$.

Table 2
Readiness Scale Items, Item-total Correlations, Cronbach's Alpha without Item, and Factor Loading for the undergraduate Sample ($N = 195$)

Item	*M*	*SD*	Item-total *r*	α without item	Factor loading
1. I would be comfortable using an internet-connected device several times a week to participate in a lifestyle intervention online	4.13	1.32	.55	.75	.65
2. I feel that my previous experiences with online technologies are important to my success with using a lifestyle intervention	4.31	1.18	.50	.76	.64
3. Using internet technologies makes me more efficient in my daily functioning	4.70	1.09	.63	.74	.79
4. I believe that I am able to make good use of internet websites and web applications	5.10	.80	.61	.75	.77
5. Using internet technologies provide me with a feeling of independence	4.41	1.13	.51	.76	.69
6. I enjoy the challenge of figuring out the different functions of websites and web applications	3.90	1.41	.49	.77	.64
7. I use an internet connected device to keep track of my lifestyle (e.g., daily tasks, goals, and meetings)	4.12	1.53	.44	.78	.56

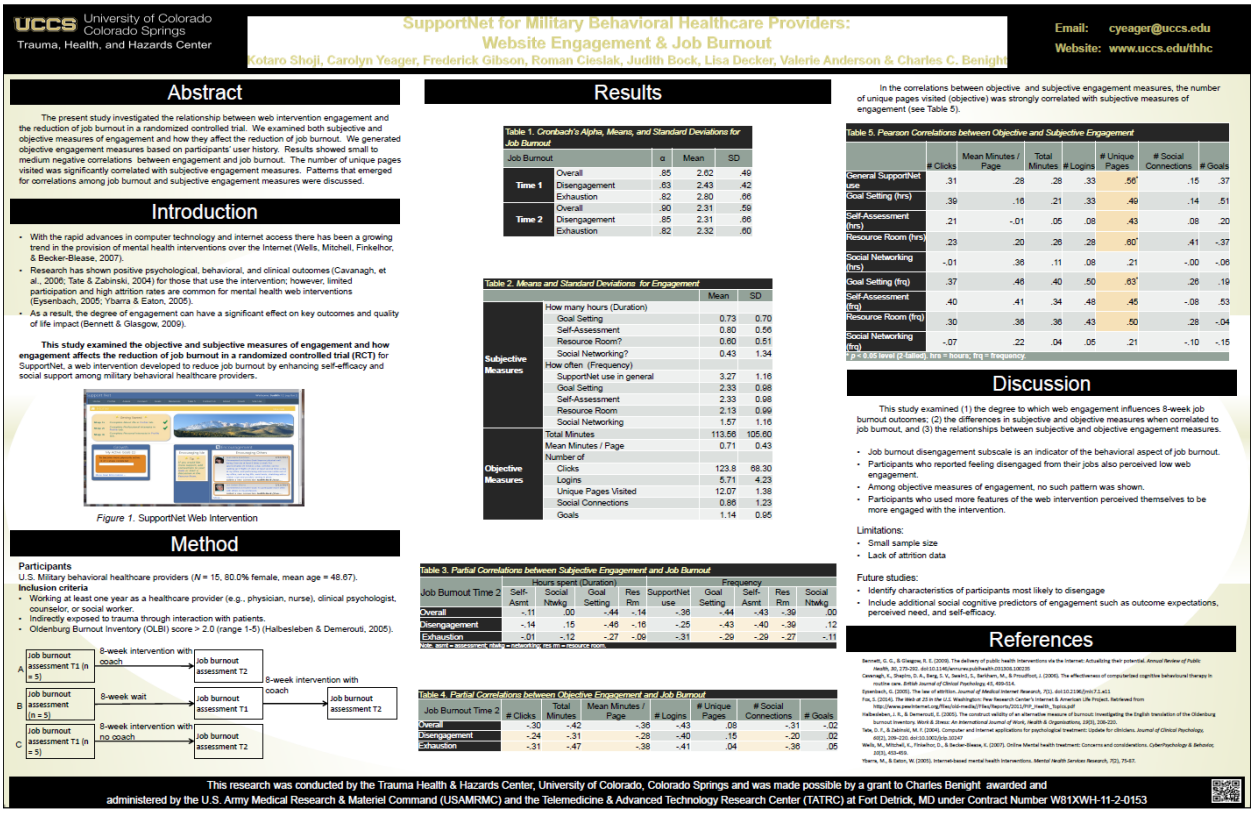
Note. α without item = Overall Cronbach's alpha of scale if that particular item were to be removed, Factor loading was from PCA analysis.

- Results showed the eHealth readiness scale items demonstrate good internal consistency and a stable one-factor solution.
- Results indicated the eHealth readiness scale is a sufficient criterion valid measure of self-efficacy and ease with technology usage.
- Contrary to the hypothesis, results did not illustrate any significant relation between eHealth readiness and time spent on the SupportNet website. Thus predictive validity was unable to be established for the scale.
- Small sample size ($n = 51$) and non-normal distribution of usage data likely had a significant impact on results.
- Other limitations included a specific sample (for Study 2) and no measure of temporal stability.
- Those deemed "ready" may not necessarily use interventions more.
- Future research should focus on further examining the relationship between readiness and eHealth intervention usage with a larger, general sample of participants.
- Quality of web-intervention modules, navigability, and structure of eHealth programs should also be examined in relation to readiness and usage to determine the effect of system design on adherence.

ACKNOWLEDGEMENTS

This project was made possible by a research grant awarded to Charles C. Benight and administered by the U.S. Army Medical Research & Materiel Command (USAMRMC) and the Telemedicine & Advanced Technology Research Center (TATRC) at Fort Detrick, MD under Contract Number W81XWH-11-2-0153.

Appendix 4: SupportNet for military behavioral healthcare providers: Website engagement and job burnout



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SupportNet for Military Behavioral Healthcare Providers: Website Engagement & Job Burnout

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Abstract

The present study investigated the relationship between web intervention engagement and the reduction of job burnout in a randomized controlled trial. We examined both subjective and objective measures of engagement and how they affect the reduction of job burnout. We generated objective engagement measures based on participants' user history. Results showed small to medium negative correlations between engagement and job burnout. The number of unique pages visited was significantly correlated with subjective engagement measures. Patterns that emerged for correlations among job burnout and subjective engagement measures were discussed.

Introduction

- With the rapid advances in computer technology and internet access there has been a growing trend in the provision of mental health interventions over the Internet (Wells, Mitchell, Finkelhor, & Becker-Blease, 2007).
- Research has shown positive psychological, behavioral, and clinical outcomes (Cavanagh, et al., 2006; Tate & Zabinski, 2004) for those that use the intervention; however, limited participation and high attrition rates are common for mental health web interventions (Eysenbach, 2005; Ybarra & Eaton, 2005).
- As a result, the degree of engagement can have a significant effect on key outcomes and quality of life impact (Bennett & Glasgow, 2009).

This study examined the objective and subjective measures of engagement and how engagement affects the reduction of job burnout in a randomized controlled trial (RCT) for SupportNet, a web intervention developed to reduce job burnout by enhancing self-efficacy and social support among military behavioral healthcare providers.

Figure 1. SupportNet Web Intervention

Method

Participants
U.S. Military behavioral healthcare providers (*N* = 15, 80.0% female, mean age = 46.67).
Inclusion criteria
- Working at least one year as a healthcare provider (e.g., physician, nurse), clinical psychologist, counselor, or social worker.
- Indirectly exposed to trauma through interaction with patients.
- Oldenburg Burnout Inventory (OLBI) score > 2.0 (range 1-5) (Halbesleben & Demerouti, 2005).

Results

Table 1. Cronbach's Alpha, Means, and Standard Deviations for Job Burnout

Job Burnout		α	Mean	SD
Time 1	Overall	.85	2.62	.49
	Disengagement	.63	2.43	.42
	Exhaustion	.82	2.80	.66
Time 2	Overall	.90	2.31	.59
	Disengagement	.85	2.31	.66
	Exhaustion	.82	2.32	.60

Table 2. Means and Standard Deviations for Engagement

		Mean	SD
Subjective Measures	How many hours (Duration)		
	Goal Setting	0.73	0.70
	Self-Assessment	0.80	0.56
	Resource Room?	0.80	0.51
	Social Networking?	0.43	1.34
	How often (Frequency)		
	SupportNet use in general	3.27	1.16
	Goal Setting	2.33	0.98
	Self-Assessment	2.33	0.98
	Resource Room	2.13	0.99
	Social Networking	1.57	1.16
Objective Measures	Total Minutes	113.56	105.60
	Mean Minutes / Page	0.71	0.43
	Number of		
	Clicks	123.8	68.30
	Logins	5.71	4.23
	Unique Pages Visited	12.07	1.38
	Social Connections	0.86	1.23
	Goals	1.14	0.95

Table 3. Partial Correlations between Subjective Engagement and Job Burnout

	Hours spent (Duration)				Frequency				
Job Burnout Time 2	Self-Asmt	Social Ntwkg	Goal Setting	Res Rm	SupportNet use	Goal Setting	Self-Asmt	Res Rm	Social Ntwkg
Overall	-.11	.00	-.44	-.14	-.36	-.44	-.43	-.39	.00
Disengagement	-.14	.15	-.46	-.16	-.25	-.43	-.40	-.39	.12
Exhaustion	-.01	-.12	-.27	-.09	-.31	-.29	-.29	-.27	-.11

Table 4. Partial Correlations between Objective Engagement and Job Burnout

Job Burnout Time 2	# Clicks	Total Minutes	Mean Minutes / Page	# Logins	# Unique Pages	# Social Connections	# Goals
Overall	-.30	-.42	-.36	-.43	.08	-.31	-.02
Disengagement	-.24	-.31	-.28	-.40	.15	-.20	.02
Exhaustion	-.31	-.47	-.38	-.41	.04	-.36	.05

In the correlations between objective and subjective engagement measures, the number of unique pages visited (objective) was strongly correlated with subjective measures of engagement (see Table 5).

Table 5. Pearson Correlations between Objective and Subjective Engagement

	# Clicks	Mean Minutes / Page	Total Minutes	# Logins	# Unique Pages	# Social Connections	# Goals
General SupportNet use	.31	.28	.28	.33	.56*	.15	.37
Goal Setting (hrs)	.39	.16	.21	.33	.49	.14	.51
Self-Assessment (hrs)	.21	-.01	.05	.08	.43	.08	.20
Resource Room (hrs)	.23	.20	.26	.28	.60*	.41	-.37
Social Networking (hrs)	-.01	.36	.11	.08	.21	-.00	-.06
Goal Setting (frq)	.37	.46	.40	.50	.63*	.26	.19
Self-Assessment (frq)	.40	.41	.34	.48	.45	-.08	.53
Resource Room (frq)	.30	.36	.36	.43	.50	.28	-.04
Social Networking (frq)	-.07	.22	.04	.05	.21	-.10	-.15

* p ≤ 0.05 level (2-tailed), hrs = hours; frq = frequency

Discussion

This study examined (1) the degree to which web engagement influences 8-week job burnout outcomes; (2) the differences in subjective and objective measures when correlated to job burnout, and (3) the relationships between subjective and objective engagement measures.

- Job burnout disengagement subscale is an indicator of the behavioral aspect of job burnout.
- Participants who reported feeling disengaged from their jobs also perceived low web engagement.
- Among objective measures of engagement, no such pattern was shown.
- Participants who used more features of the web intervention perceived themselves to be more engaged with the intervention.

Limitations:
- Small sample size
- Lack of attrition data

Future studies:
- Identify characteristics of participants most likely to disengage
- Include additional social cognitive predictors of engagement such as outcome expectations, perceived need, and self-efficacy.

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Appendix 5: SupportNet: Preliminary results of a randomized controlled trial.

UCCS University of Colorado Colorado Springs
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SupportNet: Preliminary Results of a Randomized Controlled Trial

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Abstract

The present study examined the effectiveness of the SupportNet intervention, designed to reduce job burnout among behavioral healthcare providers for U.S. military personnel in a randomized controlled trial (RCT). SupportNet is an online intervention, developed based on a theoretical framework of social cognitive theory, designed to reduce job burnout by enhancing self-efficacy and social support. Results of the RCT showed a significant reduction in job burnout among participants who used SupportNet with a coaching component. Findings are discussed in relation to the coaching component of the intervention.

Introduction

- Behavioral healthcare providers for military personnel are often exposed to indirect trauma through their work with clients; the rate of secondary traumatic stress (STS) among these providers has been estimated at 19.2% (Cieslak et al., 2013).
- Because STS is highly correlated with job burnout, these providers experience a high probability of suffering the effects of burnout.
- We developed the SupportNet intervention (website and professional coaching) to reduce job burnout among military behavioral healthcare providers.

Objective: This study examined the effectiveness of the SupportNet intervention in reducing job burnout among military behavioral healthcare providers in the U.S., using a randomized controlled trial (RCT).

SupportNet Intervention

SupportNet, developed based on the theoretical framework of social cognitive theory, is a web-based intervention aiming to reduce job burnout among U.S. military behavioral healthcare providers. SupportNet consists of six activities (self-assessment, goal setting, life balance, resources, relaxation, and social networking goal enhancement). For one group, coaches guided users through once a week 30-minute sessions on the website use and life improvement. Coaches helped users set up a goal in the goal setting activity and check the progress on user's goal achievement.

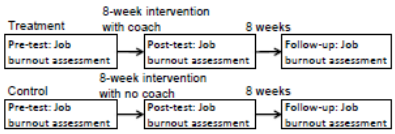
Method

Participants were 64 behavioral healthcare providers working with military personnel in the U.S. who completed the pre-test survey. Among those 64 participants, 15 of them completed the intervention.

Inclusion criteria

(a)Working at least one year as a healthcare provider (e.g., physician, nurse), clinical psychologist, counselor, or social worker.
(b) Being indirectly exposed to trauma through interaction with patients.
(c) Job burnout (Halbesleben & Demerouti, 2005) scores > 2.0.

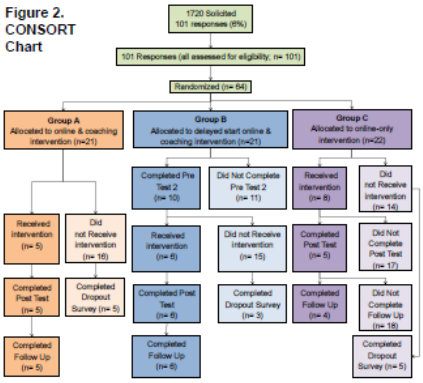
Figure 1. The Flow of the RCT



To compare job burnout pre-, post-, and follow-up RCT between the two groups, we conducted a 3 (time: pre-RCT vs. post-RCT vs. follow-up) by 2 (group) mixed analysis of variance (ANOVA) for both completers and using the intent-to-treat analysis.

- Completers analysis ($n_{Treatment}$ = 11, $n_{Control}$ = 4).
- Intent-to-treat analysis ($n_{Treatment}$ = 42, $n_{Control}$ = 22).
  - Last Observation Carried Forward method.

Figure 2. CONSORT Chart



Results

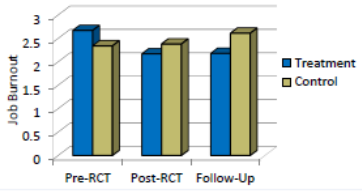
Table 1. Demographic Information and Means and Standard Deviations for Job Burnout for Completers

Variable	Group			
	Treatment	Control	Total	p
Age (SD)	54.00 (8.35)	42.80 (9.42)	48.00 (10.92)	.02
Female %	60.0%	80.0%	78.6%	.55
In a long-term relationship	60.0%	80.0%	78.6%	.11
Job burnout T1	2.61 (0.48)	2.34 (0.36)	2.53 (0.46)	.33
Job burnout T2	2.17 (0.43)	2.38 (0.73)	2.23 (0.51)	.53
Job Burnout T3	2.20 (0.42)	2.61 (1.05)	2.32 (0.64)	.30

Note. p values indicated comparisons between two groups.

- No significant main effect for time, F(2, 26) = 1.32, p = .28, partial eta-squared = .09.
- No significant main effect for the group, F(1, 13) = 0.12, p = .73, partial eta-squared = .01.
- Significant interaction effect between the group and time, F(2, 26) = 3.78, p = .04, partial eta-squared = .23 (see Figure 3).

Figure 2. Interaction Effect between Group and Time on Job Burnout



Follow-up tests in the treatment group

- Pre- and post-RCT (p < .01)
- Pre- and follow-up (p = .01)

The intent-to-treat analysis

- Consistent results for the omnibus tests with the analysis with completers.
- No significant differences in the follow-up tests.

Discussion

- The results of present study showed participants who used the SupportNet with coaching guidance reduced job burnout after the 8-week intervention more than the other group.
- Job burnout among those who participated without coach's guidance was not different between pre- and post-RCT.
- These results indicated that the coaching component with online support was effective in this population. Behavioral healthcare providers may prefer face-to-face interaction rather than working solely online.
- Unclear whether coaching alone or coaching with an online system would be most effective.

Limitations:

- Dropouts
- Engagement in the intervention

Future studies:

- Apply the coach-online intervention model for other populations (e.g., firefighters, medical providers, teachers).
- Increase engagement in the intervention.

References

Cieslak, R., Anderson, V., Bock, J., Moore, B. A., Peterson, A. L., & Benight, C. C. (2013). Secondary traumatic stress among mental health providers working with the military: Prevalence and its work- and exposure-related correlates. *The Journal of Nervous and Mental Disease, 201*(11), 917–925. doi:10.1097/NMD.0000000000000034

Halbesleben, J. R. B., & Demerouti, E. (2005). The construct validity of an alternative measure of burnout: Investigating the English translation of the Oldenburg Burnout Inventory. *Work and Stress, 19*, 208–220. doi:10.1080/02678370500340728

This research and development project was conducted by the Trauma Health & Hazards Center, University of Colorado, Colorado Springs and is made possible by a research grant that was awarded and administered by the U.S. Army Medical Research & Materiel Command (USAMRMC) and the Telemedicine & Advanced Technology Research Center (TATRC) at Fort Detrick, MD under Contract Number W81XWH-11-2-0153

Appendix 6: The psychometric validation of a readiness scale for participants in an online intervention for burnout and secondary traumatic stress

The Psychometric Validation of a Readiness Scale for Participants in an Online Intervention for Burnout and Secondary Traumatic Stress

UCCS University of Colorado Colorado Springs

Arjun Bhalla, M.A., Robert Durham, Ph.D., Carolyn Yaeger, M.S., Emily Luther, B.A., Fred Gibson, Ph.D., & Charles Benight, Ph.D.

University of Colorado Colorado Springs

Introduction

- There has been a rise in the amount of internet-mediated/eHealth interventions.
- High rates of attrition and low adherence have been present within eHealth intervention research.
- There is a limited base of literature highlighting individual characteristics related to attrition and adherence.
- Results of the initial validation concluded the eHealth readiness scale as being an internally reliable (α =.81) and criterion valid measure of self-efficacy and ease with technology usage (Bhalla, 2014).
- The current study sought to assess the psychometric properties of the eHealth readiness scale in an RCT of the SupportNet intervention, which aimed to reduce burnout and secondary-traumatic stress in military mental health providers.

Hypotheses

It was hypothesized that the eHealth readiness scale would:

- demonstrate adequate internal consistency with Cronbach's alphas greater than or equal to .70,
- possess a one-factor solution structure
- establish predictive validity by positively correlating SupportNet usage tracking data.

Methods

Participants

- 57 military mental health providers (Age range = 29-80, *M* = 49.25, *SD* = 12.29).
- Recruited through research participation solicitations via emails through work places, professional LISTSERVs and cold telephone calls

Scale Development

- The final 7-item scale was developed to encompass one's preparedness to engage in eHealth interventions.
- Items related to internet self-efficacy, attitudes toward technology, and technology usage behavior.

Measures

- **The eHealth Readiness Scale**
- **Oldenburg Burnout Inventory** (OLBI; Halbesleben & Demerouti, 2007) 16-item scale on a 5-point Likert-type scale (1 = strongly disagree and 5 = strongly disagree).
- **Secondary Traumatic Stress Scale** (STSS; Bride et al., 2004) 17-item scale using a 6-point Likert-type scale ranging from scale (0 = never and 5 = very often).
- **SupportNet Intervention Usage Tracking Data** Metrics for each participant's logins, and duration off usage

Procedure

- Participants completed an online questionnaire with several pre-intervention outcome measures.
- Inclusion criteria: Military mental health provider (on/off-post) working with individuals with PTSD on caseload, a scaled burnout score of 2 (Out of 5),
- Individuals who met the stated criteria were then contacted to request their participation in a controlled trial of SupportNet.
- Participants were randomized to one of three experimental groups (See Figure 1).

Results

- Cronbach's α =.83.
- A one-factor solution was found with an eigenvalue of 3.52, accounting for 50.34% of the variance.
- Correlations between the eHealth readiness scale and out measures of the SupportNet intervention are illustrated on Table 1.
- Statistics for individual items are illustrated on Table 2.
- No correlation was found between readiness and duration of time spent on SupportNet, $r(49) = -.19$, $p = .18$.
- Additionally, an inverse correlation between eHealth readiness and burnout scores was found, $r(51) = -.29$, $p = .04$

Table 1

Correlations, Means, and Standard Deviations for (N=52)

Measure	1	2	3	4	5	6	7	*M*	*SD*
1.Readiness	–	-29*	-.18	-.21	.04	-.03	-.10	30.23	6.22
2. OLBI		–	74**	-.14	-.25	-.12	-.11	43.81	10.75
3. STSS			–	-.31*	-.06	-.04	-.07	37.85	13.65
4. Gender				–	-.23	-.10	.05	1.27	.45
5. Age					–	.28*	.27	49.42	12.31
6. # Logins						–	81**	3.81	3.78
7. Duration							–	41.19	107.15

Note. OLBI = Oldenburg Burnout Inventory, STSS = Secondary Traumatic Stress Scale, # Logins = Number of times participants logged into SupportNet, Duration = Time spent on SupportNet in minutes. ** indicates $p < .01$. * indicates $p < .05$.

Table 2

Readiness Scale Items, Item-total Correlations, Cronbach's alpha without Item, and Factor Loading for RCT Sample (N = 57)

Item	*M*	*SD*	Item-total *r*	α without item	Factor loading
1. I would be comfortable using an internet-connected device several times a week to participate in a lifestyle intervention online	4.40	1.31	.48	.81	.58
2. I feel that my previous experiences with online technologies are important to my success with using a lifestyle intervention	4.19	1.41	.52	.81	.62
3. Using internet technologies makes me more efficient in my daily functioning	4.42	1.32	.60	.79	.72
4. I believe that I am able to make good use of internet websites and web applications	4.95	.79	.54	.81	.69
5. Using internet technologies provide me with a feeling of independence	4.32	1.24	.64	.79	.79
6. I enjoy the challenge of figuring out the different functions of websites and web applications	3.96	1.30	.71	.78	.84
7. I use an internet connected device to keep track of my lifestyle (e.g., daily tasks, goals, and meetings)	3.88	1.60	.56	.81	.70

Note. α without item = Overall Cronbach's alpha of scale if that particular item were to be removed, Factor loading was from PCA analysis.

Discussion

- Results demonstrate scale items to have a good internal consistency and a stable one-factor solution.
- Contrary to the hypothesis, results did not illustrate any significant relation between eHealth readiness and time spent on the SupportNet website. Thus predictive validity was unable to be established for the scale.
- Small sample size ($n = 51$) and non-normal distribution of usage data likely had a significant impact on results.
- Other limitations included a specific sample and no measure of temporal stability.
- Those deemed "ready" may not necessarily use interventions more.
- Future research should focus on further examining the relationship between readiness and eHealth intervention usage with a larger, general sample of participants.
- Quality of web-intervention modules, navigability, and structure of eHealth programs should also be examined in relation to readiness and usage to determine the effect of system design on adherence.

Acknoweledgements

This project was made possible by a research grant awarded to Charles C. Benight and administered by the U.S. Army Medical Research & Materiel Command (USAMRMC) and the Telemedicine & Advanced Technology Research Center (TATRC) at Fort Detrick, MD under Contract Number W81XWH-11-2-0153.

Appendix 7: Effects of sexual assault history on the relationship between secondary traumatic stress, job burnout self-efficacy, and burnout for military mental health providers

Effects of Sexual Assault History on the Relationship Between Secondary Traumatic Stress, Job Burnout Self-Efficacy, and Burnout for Military Mental Health Providers

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[1]Trauma, Health & Hazards Center, [2]Department of Psychology, University of Colorado at Colorado Springs

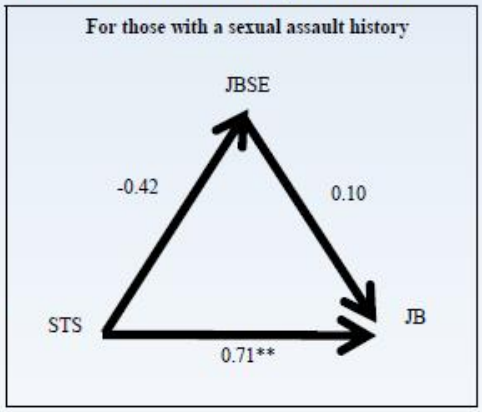
Introduction

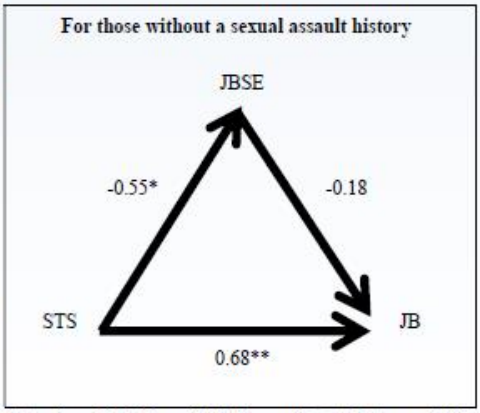
Although all mental health providers are at risk for experiencing the effects of secondary traumatic stress (STS) and job burnout (JB), those with a sexual assault (SA) history may be even more sensitive to this stress and more likely to develop JB (Maier, 2011). Job burnout self-efficacy (JBSE) may serve as a mediating mechanism between STS and JB because a belief in your ability to manage stressors often changes how challenges and goals are approached and dealt with (Alarcon, 2011; Bandura, 1978; Lee, 2011). These variables were examined in military mental health providers with and without a SA history. It was predicted that (a) STS would predict lower levels of JBSE, (b) higher levels of JBSE would predict lower levels of JB, and (c) SA status would moderate whether JBSE mediates the relationship between STS and JB.

Methods

This project examined military mental health providers, both civilian and active duty. All on-post Army mental health/behavioral health providers and select western region Tricare providers were sent an email describing the focus of the study and the study link. Participants' ages ranged from 29 to 80 years old. Participants were 65% female and 50% had a doctoral degree. Out of 77 participants, 37 had a previous history of sexual assault. SA was defined as rape or attempted rape, unwanted sexual experience.

Figure 1. The indirect effect of job burnout self-efficacy in the relationship between secondary traumatic stress and job burnout with sexual assault history as a moderator.





Note: * $p < 0.05$; ** $p < 0.01$. The coefficients between JBSE and JB was marginally significant, $p = .06$.

Results

A moderated-mediation analysis showed the indirect effect of JBSE in the relationship between STS and JB was dependent on SA. The indirect effect was significant when participants did not have SA experience ($B = 0.09$, Bootstrap 95% CI = 0.02 – 0.20). However, there was no such indirect effect when participants had SA history ($B = 0.00$, Bootstrap 95% CI = -0.03 – 0.08). Individuals with a SA history had higher levels of STS than those without a SA history, $t(75) = 2.20$, $p = 0.03$. There was not a significant difference between those with a SA history and those without a SA history for JB, $t(75) = 0.06$, $p = 0.95$, or JBSE, $t(75) = -0.11$, $p = 0.92$.

Table 1
Correlations Among Study Variables

	Secondary Traumatic Stress	Job Burnout
Job Burnout	.02	1
Job Burnout Self-Efficacy	-.35**	-0.35**

Note. * $p < .05$; ** $p < .01$.

Discussion

The results suggest that JBSE serves as a self-regulatory role by which STS relates to JB in providers without a SA history. For those with a SA history, the distress caused by the trauma may override the buffering effect that JBSE has on the relationship between STS and JB. These providers may have unique challenges and self-regulatory processes related to STS and JB that should be explored further.

University of Colorado Colorado Springs

This research was made possible by a research grant that was awarded and administered by the U.S. Army Medical Research & Materiel Command (USAMRMC) and the Telemedicine & Advanced Technology Research Center (TATRC) at Fort Detrick, MD under Contract Number W81XWH-11-2-0153.
The views expressed in this poster are solely those of the authors and do not represent an endorsement by or the official policy of the U.S. Army, the Department of Defense, or the U.S. government.

Appendix 8: Which comes first: Job burnout or secondary traumatic stress?

ESTSS
2015, VILNIUS

XIV Conference of European Society for Traumatic Stress Studies

Trauma in Changing Societies: Social Contexts and Clinical Practice

10-13 June 2015 Vilnius, Lithuania

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ORAL PRESENTATION SESSION: **Secondary traumatization.**

Chair: Roman Cieslak

June 12th, 2015, 16:15–17:45, Hall GAMMA

1. **What are the best predictors of PTSD in Portuguese firefighters?**
   Angela Maia, Ricardo Pinto, Sandra Henriques, Claudia Carvalho, Ines Jongenelen

2. **Mental health help-seeking amongst police officers with a military background: A theoretical model based on social identity.**
   Liz Royle

3. **Trauma exposure, coping strategies and family support: a Portuguese volunteer firefighters sample**.
   Rafaela Lopes, Angela Maia

4. **Which comes first, job burnout or secondary traumatic stress?**
   Roman Cieslak, Kotaro Shoji, Magdalena Lesnierowska, Ewelina Smoktunowicz, Judith Bock, Charles C. Benight

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Which Comes First, Job Burnout or Secondary Traumatic Stress?

Roman Cieslak,
Kotaro Shoji,
Magdalena Lesnierowska,
Ewelina Smoktunowicz,
Judith Bock,
Charles C. Benight
Aleksandra Luszczynska

UCCS University of Colorado Colorado Springs SWPS UNIVERSITY OF SOCIAL SCIENCES AND HUMANITIES

First Things First

This study was supported by:

1. The grant awarded to Charles C. Benight and administered by the U.S. Army Medical Research and Materiel Command and the Telemedicine and Advanced Technology Research Center at Fort Detrick, Maryland, under Contract Number W81XWH-11-2-0153;
2. The grant from the National Science Center, Poland (N N106 139537) awarded to Roman Cieslak.

The views expressed in this presentation are solely those of the authors and do not represent an endorsement by or the official policy of the U.S. Army, the Department of Defense, or the U.S. government.

Shoji, K., Lesnierowska, M., Smoktunowicz, E., Bock, J. Luszczynska, A., Benight, C., & Cieslak, R. (in preparation). *What Comes First: Job Burnout or Secondary Traumatic Stress? A Longitudinal Investigation of Bidirectional Relationships*.

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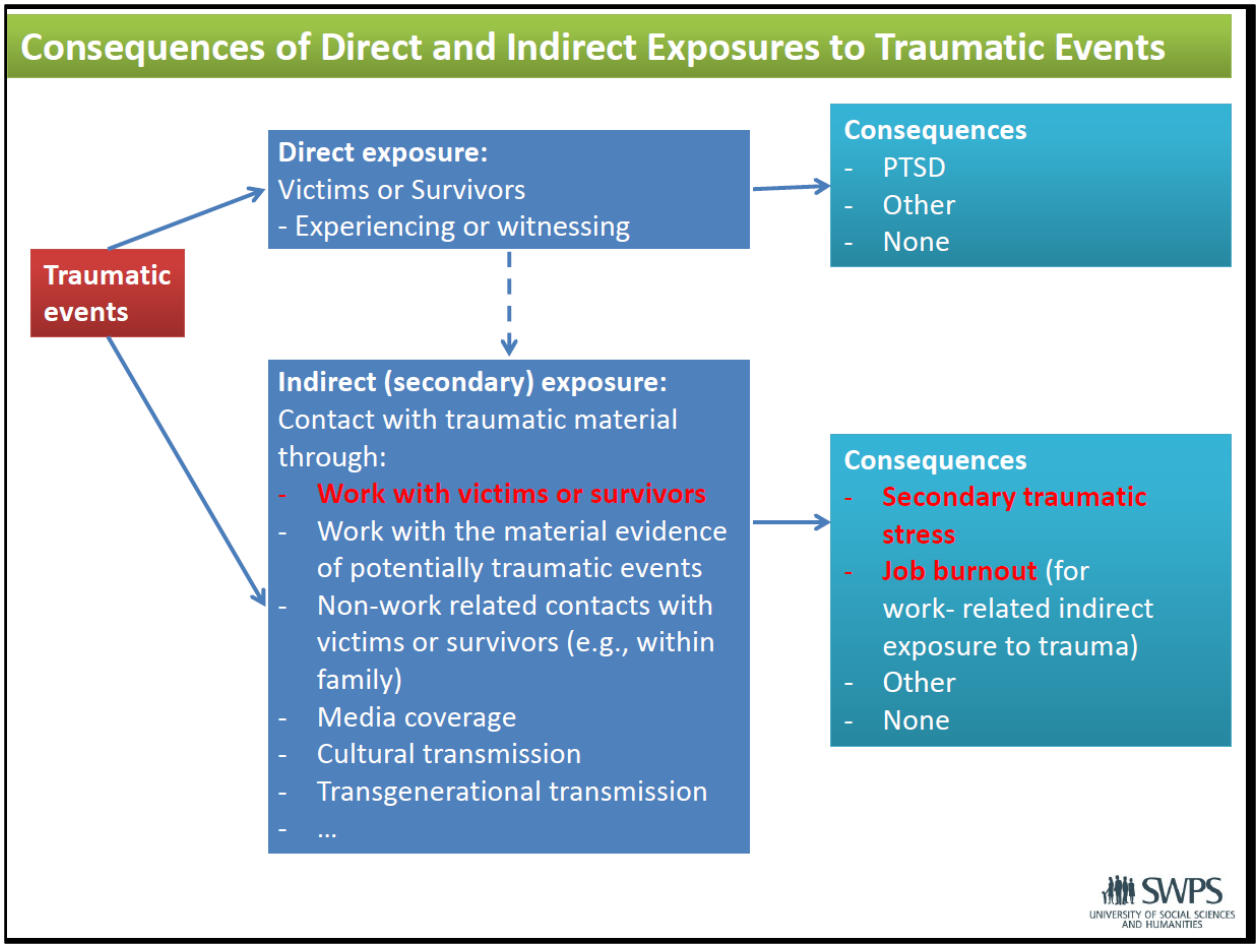
Consequences of Direct and Indirect Exposures to Traumatic Events
Traumatic events
Direct exposure:
Victims or Survivors
- Experiencing or witnessing
Consequences
- PTSD
- Other
- None
Indirect (secondary) exposure:
Contact with traumatic material through:
- Work with victims or survivors
- Work with the material evidence of potentially traumatic events
- Non-work related contacts with victims or survivors (e.g., within family)
- Media coverage
- Cultural transmission
- Transgenerational transmission
- ...
Consequences
- Secondary traumatic stress
- Job burnout (for work- related indirect exposure to trauma)
- Other
- None
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Prevalence

Prevalence of job burnout:

- reaches up to **67%** among mental health workers (Morse , Salyers , Rollins, Monroe-DeVita, Pfahler, 2012)

The prevalence of secondary traumatic stress (STS):

- **15.2%** among social workers (Bride, 2007)
- **19.2%** among U.S. mental health providers working with the military (Cieslak, Anderson, Bock, Moore, Peterson, Benight (2013),
- **39%** among juvenile justice education workers (Smith Hatcher, Bride, Oh, King, Catrett, 2011)

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STS: Definitions

Secondary traumatic stress (also called secondary posttraumatic stress; secondary PTSD) is usually conceptualized as reactions resembling PTSD and thus includes symptoms that are parallel to those observed in people directly exposed to trauma (Bride et al., 2004)

- *Secondary Traumatic Stress Scale* (STSS; Bride et al., 2004), 17 items to measure three clusters of symptoms: **intrusive re-experiencing** of the traumatic material, **avoidance** of trauma triggers and emotions, and increased physical **arousal** (Bride et al., 2004) (see criteria B, C, and D for PTSD in DSM-IV).

Vicarious trauma focuses on cognitive effects of indirect exposure. A negative shift in worldview occurs as a result of an empathetic engagement with clients' or patients' traumatic material (Pearlman, 1996).

- *Traumatic Stress Institute Belief Scale, Revision L* (TSI-BSL; Pearlman, 1996) measures vicarious trauma and accounts for cognitive disruptions in the five schema areas: safety, trust, esteem, intimacy, and control.

Compassion fatigue is defined as a reduced empathic capacity or client interest manifested through behavioral and emotional reactions from exposure to traumatizing experiences of others (Adams, et al., 2006).

- *Professional Quality of Life* (ProQOL; Stamm, 2010).

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Job Burnout: Three-Component Definition

Job burnout may be defined as "a prolonged response to chronic emotional and interpersonal stressors on the job, and is defined by three dimensions: **exhaustion, cynicism, and inefficacy**" (Maslach et al., 2001, p. 397).

- *The Maslach Burnout Inventory – General Survey* (MBI-GS; Maslach et al., 2001).
- *The MBI-Human Services Survey* - in occupations requiring contact with patients
- *the MBI-Educators Survey* – for professionals working with students or pupils

	Range of correlation coefficients (r) retrieved from original studies	The estimate of the average effect (weighted r)
SE – JB	-.609 – .224	-.327
SE – Exhaustion	-.549 – .007	-.306
SE – Depersonalization/cynicism	-.561 – -.050	-.325
SE – Lack of accomplishment/inefficacy	**-.836 – -.068**	**-.487**

Shoji, K., Cieslak, R., Smoktunowicz, E., Rogala, A., Benight, C., & Luszczynska, A. (in press). Associations Between Job Burnout and Self-Efficacy: A Meta-Analysis. *Anxiety, Stress, & Coping*. doi:10.1080/10615806.2015.1058369

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A Two-Dimensional Job Burnout Framework

A two-dimensional job burnout framework focuses on

- **exhaustion** and
- **disengagement** from work, defined as "distancing oneself from one's work and experiencing negative attitude toward the work objects, work content, or one's work in general" (Demerouti, Bakker, Vardakou, & Kantas, 2003, p. 14).

- *The Oldenburg Burnout Inventory* (OLBI)

Burnout defined as "a consequence of intensive physical, affective, and cognitive strain, i.e., as a long-term consequence of prolonged exposure to certain job demands" (Demerouti et al., 2003, p. 14).

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Psychological Services
2014, Vol. 11, No. 1, 75–86

1541-1559/14/$12.00 DOI: 10.1037/a0033798

A Meta-Analysis of the Relationship Between Job Burnout and Secondary Traumatic Stress Among Workers With Indirect Exposure to Trauma

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University of Colorado at Colorado Springs

Aleksandra Luszczynska
University of Colorado at Colorado Springs and University of Social Sciences and Humanities

Charles C. Benight
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Description of Analyzed Material

k = 41 original studies
N = data from 8,256 workers were analyzed
Sample sizes: varied from 13 to 961 participants (*M* = 198.63 , *SD* = 205.48)
Gender: 59.03% of women in the average sample

Occupational groups:

- therapists, mental health professionals, social workers, and counselors (36.58%; *k* = 15)
- emergency, ambulance or rescue workers (12.20%; *k* = 5)
- child care workers and child healthcare providers (9.76%; *k* = 4)
- nurses (7.32%; *k* = 3)
- forensic specialists (4.88%; *k* = 2)
- chaplains (4.88%; *k* = 2)
- and other non-categorized professionals (24.39%, *k* = 10)

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Conclusions in the Meta-Analysis

Conclusion:

- There is a strong correlations between STS and JB (***r* = .691; 48%** of shared variance)
- Cultural and methodological factors might be responsible for the size of the correlations.

Question:

- **Coexistence or causal** relationship between STS and JB?

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Aims of the Study

We **aimed** at testing the **directions** of the associations between job burnout and STS

Hypotheses were tested in **two longitudinal studies**

In particular, we explored the following three alternative hypotheses:

1. Job burnout at Time 1 would predict STS at Time 2 whereas STS at Time 1 would not predict job burnout at Time 2.
   JB → STS

2. STS at Time 1 would predict job burnout at Time 2 whereas job burnout at Time 1 would not explain STS at Time 2
   STS → JB

3. Job burnout at Time 1 would explain STS at Time 2 and STS at Time 1 would predict job burnout at Time 2
   JB ←→ STS

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Participants

Study 1: **U.S. behavioral healthcare providers** working with military personnel suffering from trauma

Study 2: **Polish mental and healthcare professionals working** with civilians exposed to various traumatic experiences

Inclusion criteria:

Study 1:

(a) working at least one year as a behavioral healthcare provider, clinical psychologist, counselor, or social worker

(b) providing services for **military personnel**; and

(c) experiencing indirect exposure to traumatic stress through their work.

Study 2:

(a) working for at least one year as a healthcare provider, social worker, or first responder

(b) providing services for **civilians** exposed to traumatic events; and

(c) experiencing indirect exposure to trauma at work

Sample size

Study 1: 294 at Time 1 and **135** at Time 2 (6-month gap)

Study 2: 304 at Time 2 and **194** at Time 2 (6-month gap)

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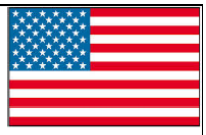
Participants



Study 1

Age : *M* = 50.62 years old (*SD* = 12.58)

Occupation: **clinical psychologists** (37.0%),
counselors (28.9%),
social workers (20.7%), and
healthcare providers (6.7%).

Indirect traumatic exposure: life threatening illness or injury (91.9%),
military combat (91.1%),
sudden unexpected death of someone close (90.4%),
sexual assault (87.4%),
physical assault (85.9%),
transportation accidents (83.7%),
natural disasters (68.9%), and
life threatening crime (57.0%).

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Participants

Study 2

Age: M = 35.10 years old (*SD* = 8.08).

Occupation: **healthcare providers** (44.8%),
social workers (41.8%), and
other professions (11.9%).

Indirect traumatic exposure: life-threatening injury or illness (88.1%),
physical assault (87.1%),
sudden unexpected death of someone close (83.5%),
transportation accidents (71.1%),
sexual assault (50.5%),
natural disasters (30.4%),
combat-related traumatic events (7.2%).

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Participants

Measure	Levels	Study 1 Time 1	Study 1 Time 2	Study 2 Time 1	Study 2 Time 2
Gender					
	Female	**66.3% (195)**	**71.1% (96)**	**76.3% (232)**	**79.9% (155)**
	Male	33.7% (99)	28.9% (39)	22.7% (69)	18.6% (36)
Relationship status					
	Long-term relationship (LTR)	**76.2% (224)**	**72.6% (98)**	**73.7% (224)**	**77.3% (150)**
	Not in LTR	21.4% (63)	25.2% (34)	25.7% (78)	22.2% (43)
Education					
	High school	0.3% (1)	0 (0%)	20.4% (62)	18.0% (35)
	Associate's degree	0.3% (1)	0 (0%)	-	-
	Bachelor's degree	2.0% (6)	1.5% (2)	**21.4% (65)**	**19.1% (37)**
	Master's degree	**45.2% (133)**	**51.1% (69)**	**56.6% (172)**	**61.3% (119)**
	Doctorate degree	**52.0% (153)**	**47.4% (64)**	1.0% (3)	0.5% (1)

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Measures

Job burnout. *The Oldenburg Burnout Inventory* (Halbesleben & Demerouti, 2005) is a 16-item questionnaire used to assess **disengagement** (eight items) and **exhaustion** (eight items). Response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

- Disengagement in Study 1: α = .85 at T1 and α =.86 at T2
- Exhaustion in Study 1: α = .81 at T1 and α = .85 at T2
- Disengagement in Study 2: α = .79 at T1 and α =.81 at T2
- Exhaustion in Study 2: α = .82 at T1 and α = .78 at T2

Secondary traumatic stress. *The Secondary Traumatic Stress Scale* (Bride, Robinson, Yegidis, & Figley, 2004) is a 17-item measure of the frequency of STS symptoms in the previous month. Responses are provided on a 5-point scale ranging 1 (*never*) to 5 (*very often*).

- Study 1: α = .93 at T1 and α = .93 at T2
- Study 2: α = .92 at t1 and α = .93 at T2

Indirect exposure to trauma. *The Secondary Trauma Exposure Scale* (Cieslak et al.,2013)

A list of 10 events; participants indicate whether they had experienced each event through work with their clients.

Responses: 1 (*never*) to 7 (*every day*).

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Dropout Analysis

Study 1: **no significant differences between completers and dropouts** in:

- disengagement at T1, t(292) = 0.82, p = .41,
- exhaustion at T1, t(292) = 0.90, p = .37,
- STS at T1, t(292) = 0.14, p = .89,
- age, t(288) = 0.08, p = .94,
- gender, $\chi 2(1) = 0.40$, p = .53,
- profession, $\chi 2(3) = 0.28$, p = .96,
- relationship status, $\chi 2(1) = 0.84$, p = .36, and
- education, $\chi 2(4) = 4.89$, p = .30.

Study 2: **no significant differences between completers and dropouts** in:

- T1 disengagement, $t(302) = 1.22$, $p = .22$;
- T1 exhaustion, $t(302) = 0.09$, $p = .93$,
- T1 STS, $t(302) = 0.59$, $p = .55$,
- age, $t(275) = 0.65$, $p = .52$,
- profession, $\chi^2(2) = 2.49$, $p = .29$,
- intimate relationship status, $\chi^2(1) = 3.24$, $p = .07$, and
- education, $\chi^2(3) = 5.63$, $p = .13$.

There were **more women among completers** than among drop-outs, $\chi^2(1) = 4.61$, $p = .03$

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Preliminary Analysis

Measures	Study 1 M (SD)	Study 2 (M (SD)	t
1. Emotional Exhaution T1	2.54 (0.70)	**2.82 (0.68)**	3.61***
2. Emotional Exhaution T2	2.53 (0.76)	**2.80 (0.60)**	3.45***
3. Disengagement T1	2.35 (0.70)	**2.71 (0.64)**	4.75***
4. Disengagement T2	2.40 (0.76)	**2.77 (0.65)**	4.61***
5. Secondary Traumatic Stress T1	1.88 (0.61)	**2.33 (0.68)**	6.28***
6. Secondary Traumatic Stress T2	1.76 (0.62)	**2.28 (0.69)**	7.14***
7. Work experience in years T1	**15.70 (10.38)**	10.38 (8.52)	5.09***
8. Indirect trauma frequency T1	**6.16 (1.12)**	4.79 (1.74)	8.06***

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Correlations for Study 1 (below diagonal) and Study 2 (above diagonal)

Measure	1	2	3	4	5	6	7	8
1. Emotional Exhaution T1		.69***	.68***	.49***	.68***	**.60*** **	.04	-.02
2. Emotional Exhaution T2	.77***	-	.58***	.66***	**.57*** **	.62***	.09	.01
3. Disengagement T1	.80***	.64***	-	.74***	.52***	**.45*** **	.02	-.07
4. Disengagement T2	.67***	.76***	.77***	-	**.42*** **	.42***	.00	-.00
5. Secondary Traumatic Stress T1	.64***	**.57*** **	.54***	**.48*** **	-	.79***	.17*	.10
6. Secondary Traumatic Stress T2	**.59*** **	.67***	**.52*** **	.55***	.75***	-	.23**	.14
7. Work experience in years T1	-.09	-.03	-.10	-.10	-.10	.04	-	.15*
8. Indirect trauma frequency T1	-.19*	-.24**	-.31***	-.29***	-.13	-.18*	-.11	-

* $p < .05$, ** $p < .01$, *** $p < .001$

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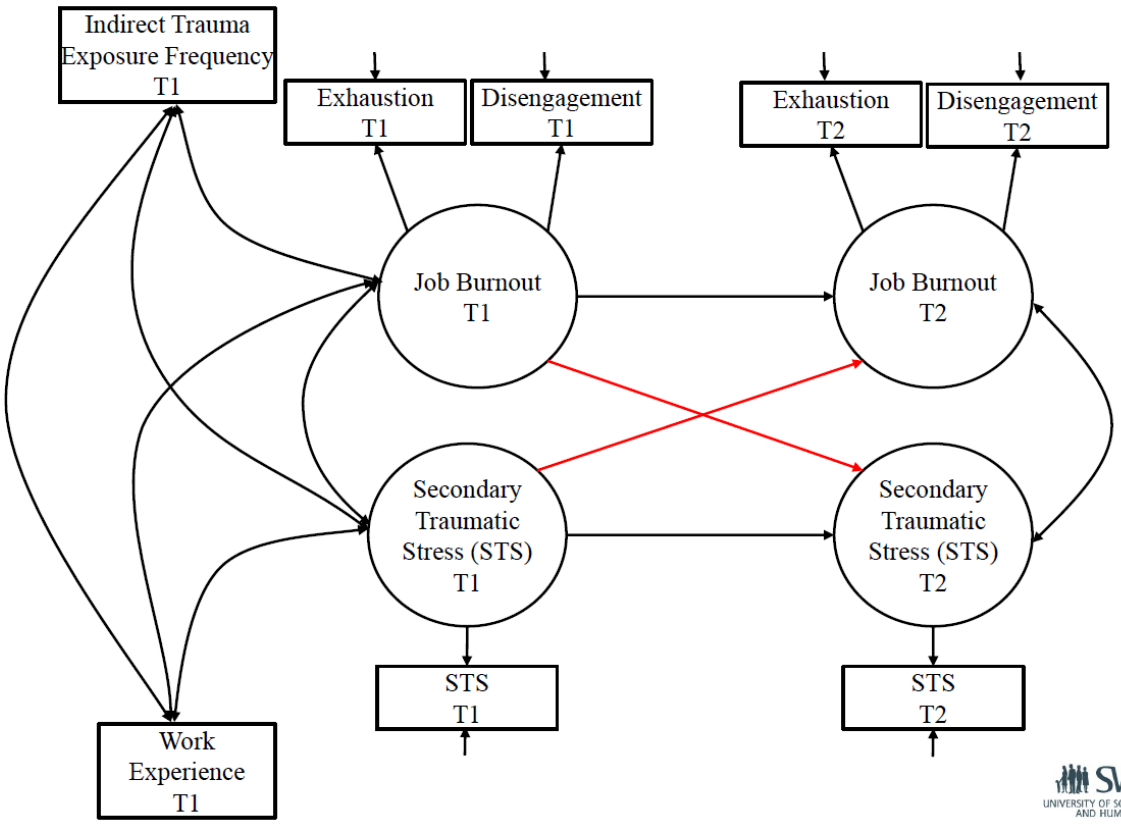
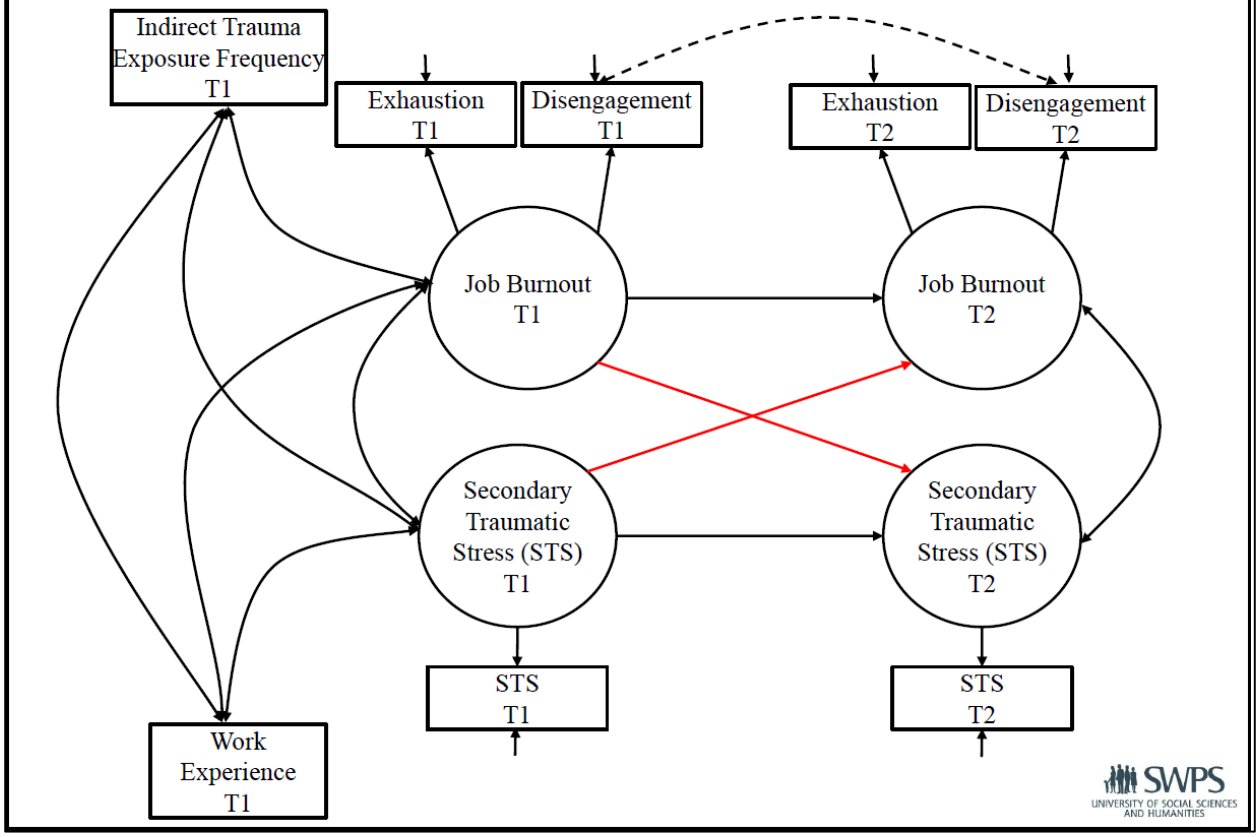
Hypothesized model

Study 1: RMSEA = .169, CFI = .922, SRMR = .041.
Study 2: RMSEA = .190, CFI = .887, SRMR = .053



Modified hypothesized model

Study 1: RMSEA = .074, CFI = .986, SRMR = .041.
Study 2: RMSEA = .027, CFI = .998, SRMR = .026



Nested models

Study	Model Description	χ^2	χ^2/df	NFI	$\Delta\chi^2$	ΔNFI
Study1						
	The modified hypothesized model	20.90	1.74	.969	-	-
	First nested model: STS T1 → Job Burnout T2 path constrained to zero	21.77	1.68	.968	0.88	.001
	Second nested model: Job Burnout T1 → STS T2 path constrained to zero	28.09	2.16	.959	7.19**	.011
Study 2						
	The modified hypothesized model	13.70	1.14	.984	-	-
	First nested model: STS T1 → Job Burnout T2 path constrained to zero	14.43	1.11	.983	0.74	.001
	Second nested model: Job Burnout T1 → STS T2 path constrained to zero	17.69	1.36	.979	3.99*	.005

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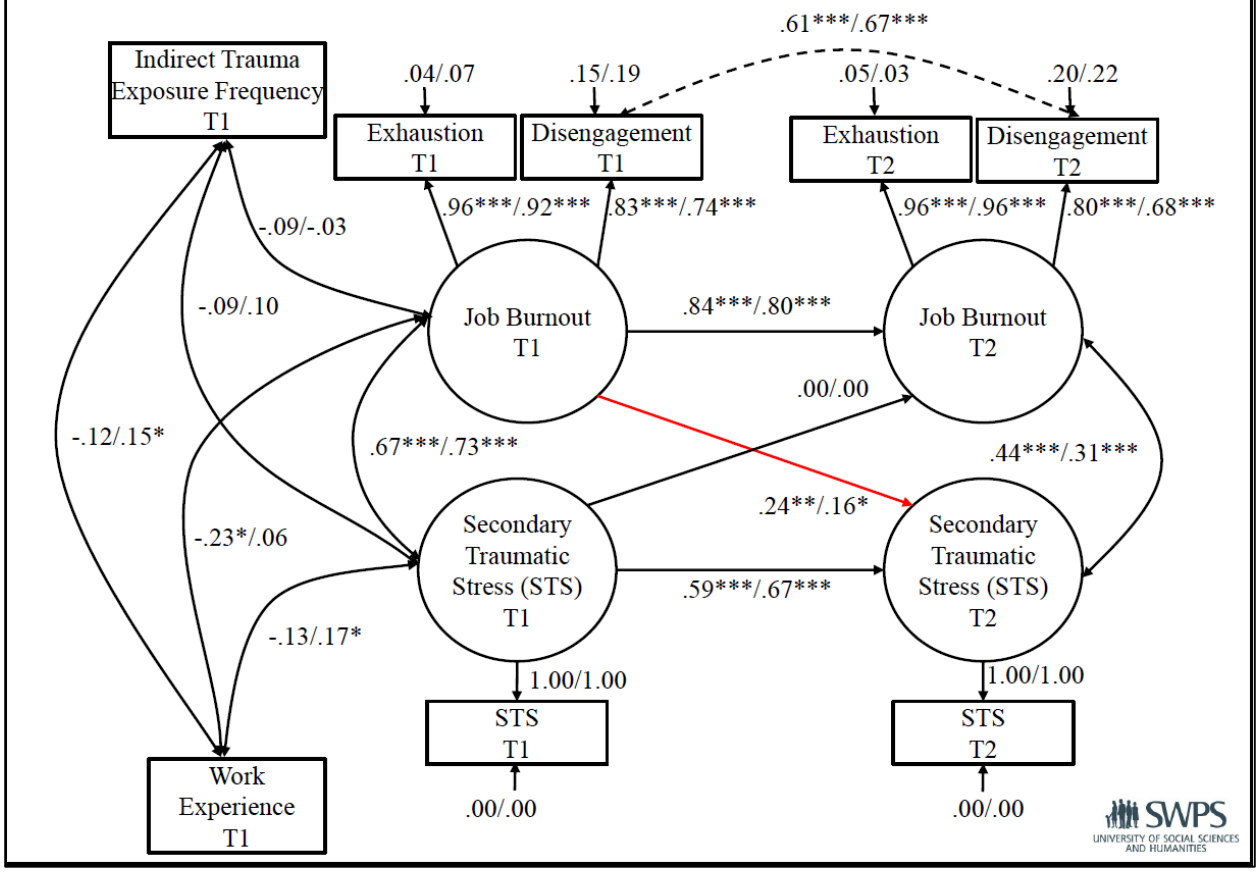
Final model


Indirect Trauma Exposure Frequency T1
.04/.07
.15/.19
.61***/.67***
.05/.03
.20/.22
Exhaustion T1
Disengagement T1
Exhaustion T2
Disengagement T2
.96***/.92***
.83***/.74***
.96***/.96***
.80***/.68***
-.09/-.03
-.09/.10
Job Burnout T1
.84***/.80***
Job Burnout T2
.00/.00
-.12/.15*
.67***/.73***
.44***/.31***
.24**/.16*
-.23*/.06
Secondary Traumatic Stress (STS) T1
.59***/.67***
Secondary Traumatic Stress (STS) T2
-.13/.17*
1.00/1.00
1.00/1.00
STS T1
STS T2
Work Experience T1
.00/.00
.00/.00
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Conclusions

- We found that **job burnout may increase a risk of developing STS**, but STS symptoms at Time 1 are unrelated to job burnout at Time 2 (Hypothesis #1 was supported. Unidirectional reltaionship: JB → STS)
- Job burnout serves as a **gateway outcome**, increasing the risk of STS (results are in line with Hobfoll's conservation of resources theory)
- **Consistent findings** across two samples
- Limited arguments for causation (→ natural experiments/interventions studies needed)
- Limited evidence for generalization of the results (→ other culturally diverse groups needed)
- Practical implications: prevention of STS through effective coping with job burnout

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Thank you

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Appendix 9: RCT CONSORT Chart